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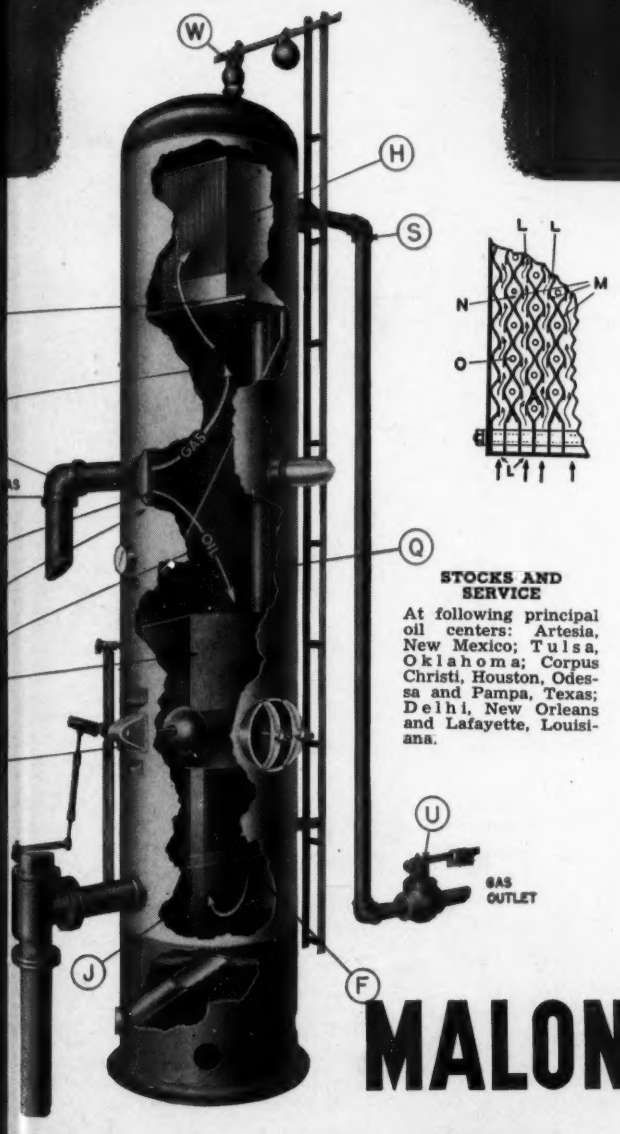

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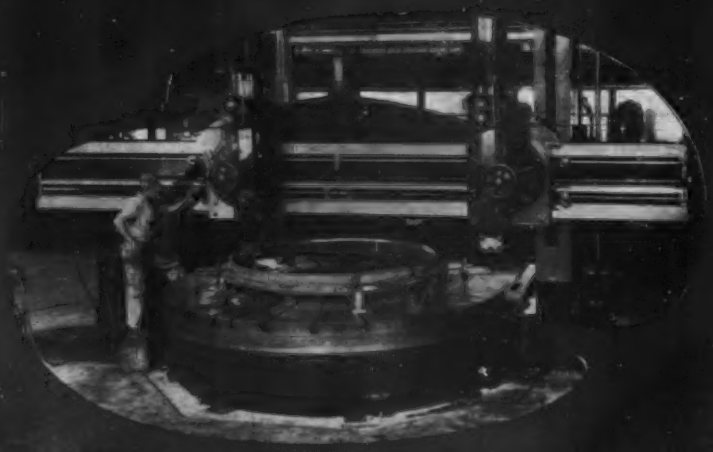

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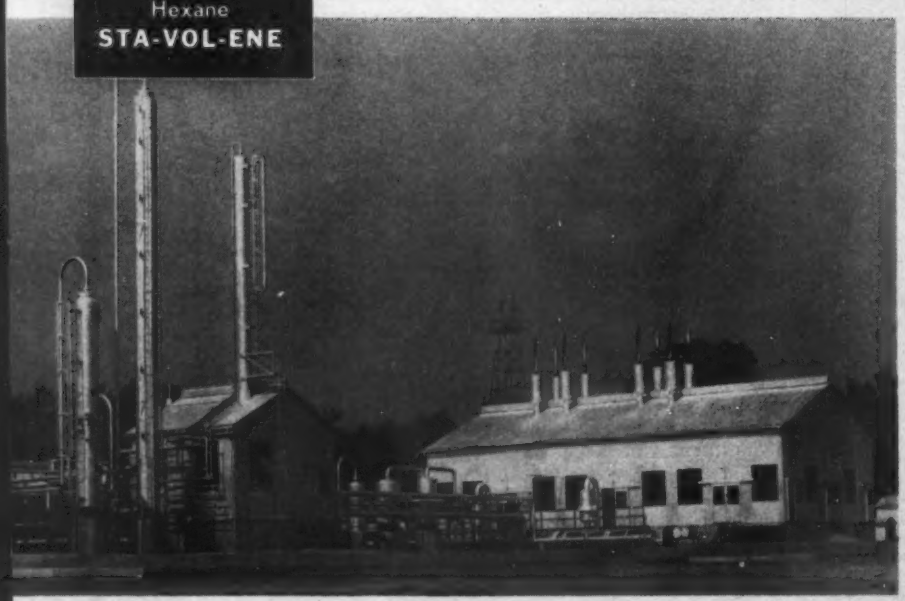

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Ten Billion Expansion

THE world petroleum industry, centering in this country, is well started on an expansion and modernization program which will require minimum expenditures of 10 billion dollars over the next 5 years. This expansion is now defined with as many projects under way as available material and trained manpower will permit.

Possibly the size of this 5-year growth can best be visualized by comparison. Other industries quite properly are pointing to what they are doing to meet the greater needs of their customers. For example, the steel industry explains in advertisements that it is spending a billion dollars to increase its capacity 2½ million tons.

But the enlargement of steel output and increases in all natural-resource and manufacturing enterprises are dwarfed by the job ahead in the oil business. The basic reason is enlarged demand. The steel industry says that its domestic demands per capita have increased 26 per cent since 1929. The petroleum requirements for each man, woman, and child in this country are now approximately double what they were in the last boom year of the twenties. Recent data reveal domestic petroleum consumption this year is running 20 per cent ahead of last year and 32 per cent over 1941.

Leading economists are in agreement that the end in increasing petroleum demands is not in sight. World requirements in excess of 10 million barrels daily are projected for 1951, an increase of approximately 2 million barrels daily over the year now being brought to a close.

When these demands are translated into field, plant, transportation, and distributing facilities, it is certain that the estimate of 2 billion dollars yearly in new facilities over the next 5 years is on the low rather than the high side. Of the 10 billion dollars approximately half will be required by the producing division and another 25 per cent by the refining branch.

To find sufficient new oil to support an increase of 2 million barrels daily in output by 1951 will mean that the present record exploration operations will have to be further enlarged wherever geological conditions are favorable for oil. Production of crude oil bears a direct relationship to drilling activities, and development operations must be increased in several countries. In refining there is the responsibility of increasing throughput to supply new markets, and also to modernize existing plants to meet new standards in quality of products and operating efficiency.

Fortunately petroleum has always been an expanding industry and builders and operators have the immediate background of experience in doing the impossible during a war period. We are now in the midst of a peacetime emergency as regards oil supplies for which the only solution is expanded output.

Prompt Action Urged to Improve Tanker and Supply Conditions

by Bertram F. Linz

WASHINGTON. — The oil-tanker and the products supply situation got top attention from both industry and Congressional committees in the Capital this week, with several suggestions being advanced for drastic government action.

The tanker transportation and the petroleum supplies committees of the National Petroleum Council both urged immediate government action to put idle tankers into service in order to supply more products for East Coast consumers, their reports coming shortly after Maritime Commission officials had told Congress their present plans could not be changed.

At the same time the Senate small business committee resumed hearings in its investigation of petroleum distribution, and heard testimony that some major companies have cut off independent dealers while others are going to extra efforts to keep independents supplied.

Immediate action by major oil companies to insure the same allocation of fuel oil and gasoline to dealers and distributors considered by them to be "spot" buyers as is being given to so-called contracted customers was demanded November 24 by Sen. Kenneth S. Wherry of Nebraska.

Wherry made his demand after a series of witnesses before his small business subcommittee had testified to their inability to secure products from suppliers from whom in past years they had made spot purchases but with whom they never had any formal contracts.

The subcommittee traced the shortage of supply from the retailer through the jobber and wholesaler to the refinery, the testimony developing that some majors, Standard Oil Co. of New Jersey and Socony-Vacuum Oil Co., Inc., among them, made every effort to keep independents going while others refused to make deliveries to any but customers who had contracted for supplies throughout last year.

Cities Service Oil Co. was named in the latter group by F. M. O'Connor, president of Connoil Corp., New York, who testified that although he purchased fuel oil in 1945 and bought 11,000,000 gal. last year, he could secure none this year because he was considered a spot buyer.

Robert Hull, sales manager for Cities Service, explained the company was endeavoring to take care of its regular customers, who are being given 10 per cent more fuel oil this year than last, and that no spot buyers are being protected, drawing from Wherry an assertion that since the company had sold such buyers when it had ample supplies it should take care of them in the emergency.

Distributors testifying before the subcommittee charged that the voluntary allocation plan of the majors was falling down because of the differences in its application by the several companies, and one witness, Howard P. Sears, Sears Oil Co., Rome, N. Y., declared the only way to meet the situation was by government allocations.

"Some of the majors will do anything they can and have leaned backwards and even given you things you possibly weren't supposed to have," Sears said, "while others take the attitude apparently that the quicker you are annihilated the better they will like it."

Military Take Is Greater

Hull told the subcommittee his company's supplies are greater than they were last year, but maintained there is no margin from which to meet the needs of spot buyers. He said the military were taking much greater volumes than a year ago, and suggested the possibility they are buying for stock-piling purposes, the first time such an idea has been advanced publicly.

Another way of increasing fuel-oil supplies would be to cut back on gasoline output, O'Connor said, but Sen. Irving M. Ives of New York, presiding temporarily, pointed out it would take all winter to prepare for rationing, which would be inherent in such a proposal.

Standard of New Jersey has adopted a policy of equitable distribution which will guarantee all customers at least as much product as they received, as last year, M. J. Rathbone, president of the company, declared. To do this the company has sought in every way to increase its own supply, even to the extent of railroading 16½ million barrels of West Texas crude to deep water at an additional cost of 55 cents a barrel, he said, and the company now believes it may exceed the allocation it set.

A Congressional investigation of the fuel situation in New England was urged by Sen. Brien McMahon of Connecticut in a letter to Majority Leader Wallace H. White of Maine.

McMahon declared that demand for fuel oil has increased far beyond the present limit of supply and predicted there would be much suffering in the northeastern states "unless everything possible is done at once."

Immediate release for operation of 100 T-2 tankers held by the Maritime Commission for sale foreign and 37 Liberty-type oil carriers also tied up was recommended this week by James P. Patterson, Pan-American Petroleum & Transport Co., chairman of the NPC tanker transportation committee.

Shortage Due to Inactive Tankers

In an exhaustive report on the tanker situation, Patterson charged that the present shortage of world transportation probably would not have occurred had all of the available vessels been in operation.

By reconditioning and returning the 137 tankers to service, he said, the present acute shortage "could be alleviated, if not completely eliminated." Nothing less will help, however, he added.

The tanker transportation committee also recommended that all applications now pending before the Maritime Commission be processed immediately so as to hasten the transfer of ships to private ownership; that the temporary lifting of the load line for coastwise trade be continued and, if possible, extended to foreign voyages; and the ship sales act be amended to extend the operating authority of the commission after March 1, next.

The committee also held that if the commission does not have the funds to recondition tankers brought out of layup, the money should be provided, and if the commission's Liberty-type tankers are not sold to United States citizens pursuant to the ship sales act, the law should be amended to permit their sale foreign

The report came a few days after Maritime Commission members told the Senate small business committee they had no intention of halting the sale of tankers to foreign buyers because of a "moral obligation."

Commissioner Grenville Mellen charged that the sale foreign was illegal so long as citizens were seeking to buy tankers, but Wade H. Skinner, general counsel of the commission, said the decision to sell them abroad was made last July 31 and any subsequent changes in domestic requests could not legally be considered. At the time of the decision, there was no demand from domestic companies, the committee was told.

The NPC tanker committee's conclusions were supported by an interim report of the committee on petroleum supplies and availability

headed by F. M. Porter, which warned "a serious petroleum shortage is imminent, particularly in the Atlantic Seaboard areas, if idle, government-owned tankers are not released promptly from tieup and reconditioned and repaired for immediate service."

Approximately 30 T-2 tankers or their equivalent should be made available to replenish depleted Atlantic Coast stocks by additional supplies from the Gulf Coast, the committee declared.

Porter asserted that currently the repair of tankers is being deferred pending sales, which have moved very slowly, and declared the controversy over their sale foreign should not be allowed to delay their return to operation. No tankers should be sold to buyers who cannot or will not put them into full service, he added.

The NPC committee also urged that the industry itself take all possible steps to improve the tanker situation, deferring all repairs possible until after the winter period, and expediting turnarounds. Barges now under construction in eastern ports should be rushed to completion to move products through inland waterways, it stated, and more crude and products could be moved by rail if the efficiency of utilization of cars was increased. As a further step, better utilization of tank trucks, and their employment as far as practicable beyond the range of their normal radius even at the sacrifice of some economy, would also help.

Porter pointed out that refineries in the Gulf Coast and Caribbean areas are in danger of being forced to run at less than capacity because tankers are not available, and plants on the Atlantic Seaboard have had to slow down their operations because of the lack of adequate service to get all available crude to them.

"These losses in refinery output cannot be made up over the critical winter shortage period," he warned.

Financial Strength of Co-Ops Due to Lack of Taxes, Derby Official Says

WASHINGTON.—Contentions of the cooperatives that their operations are "more efficient" than those of the average independent business concern were challenged last week by Richard N. Cooper, Derby Oil Co., Wichita, Kans.

On the contrary, Cooper told the House ways and means committee, cooperative management on the whole is about on a par with that of independent business, and the co-ops have been able to expand only because of the financial strength resulting from their exemption from taxation.

Cooper testified during the third week of the committee's hearings on cooperatives' tax advantages, at which representatives of the farm organizations and conventional business have alternately attacked and defined the present tax law.

"Cooperatives in the oil business are able to pay more for oil properties than they are actually worth by reason of the fact that the cooperative intends to, and does, eventually pay for these properties out of money which competing independent business pays to the federal Government in income taxes," Cooper charged.

"The only advantage which they have over us is their freedom from the payment of federal income taxes. If cooperatives were forced to pay federal income taxes, they would be able to exist and make the same profits or savings that independent business does. Conversely, if cooperatives continue to enjoy the tremendous advantage of freedom from the payment of federal income taxes, they will continue expansion which will mean the eventual elimination of independent business.

"I think the small refiner is facing a test for existence that is unsurpassed, unless cooperatives are assessed income taxes on the same basis as those applied to all noncooperative corporations."

No Justification

In a brief filed with the committee, Joseph E. Keller of the National Petroleum Association declared there is no justification for discrimination in taxation and all profits from the operation or management of business enterprise should be subject to tax at similar rates.

"The method of terminating the tax inequality," Keller declared, "is for Congress to say that any income that is not really and actually distributed in cash to the buying membership of a cooperative is subject to the same taxation to which a competitive corporation is subject.

"If money remains in the cooperative and is used for expansion purposes, as is being done in the majority of the cases now, it should be considered as profit and taxable as such.

"In effect, this position would subject to federal income tax those earnings of cooperatives which are available for, but not distributed to, patrons in cash, or its equivalent, as patronage dividends."

Fixed Prices, Allocation Of Products Suggested

THE administration is planning a voluntary petroleum conservation program, but it should have authority to put price ceilings on oil and coal and ration gasoline, Oscar L. Chapman, undersecretary of the Interior, declared Tuesday.

"While it is not believed that the over-all petroleum situation need become so acute as to require exercise of drastic Government controls, should voluntary measures prove to be inadequate, Government controls will be necessary," Chapman said.

"Therefore," he continued, "as a safeguard in case of such an eventuality, we believe that the President should have the residual authority to impose price controls on petroleum and petroleum products and to direct their allocation and rationing."

Chapman, testifying before the House banking committee in support of President Truman's proposals for economic controls to prevent inflation, proposed also that the administration be granted authority for allocating steel and coal.

Compact to Elect New Officers in December

Significance of the Marshall Plan and its effect upon domestic production will be the topic of an open forum highlighting the annual winter meeting of the Interstate Oil Compact Commission, to be held in Oklahoma City December 4-6.

Several compact committees will meet in advance of the registration date to prepare data and reports to be studied during the meeting.

The economics advisory committee will meet December 2 to prepare a report on consumption and anticipated demand. The secondary recovery advisory committee and the engineering committee will convene the following day.

Sun Appeals Ruling in Mother Hubbard Case

WASHINGTON.—Sun Oil Co. has served notice on the Department of Justice of its intention to appeal last month's ruling by Associate Justice F. Dickinson Letts of the District of Columbia Federal Court, upholding the department's objections to answering the book-length interrogatory filed by the company in the "Mother Hubbard" suit.

While lawyers say that ordinarily such a ruling is not appealable, counsel for the company is said to have discovered an old District of Columbia law which may give a tenable basis for its action.

Left: H. A. Stewart, Rocky Mountain manager for The Texas Co., newly elected president of the Rocky Mountain Oil and Gas Association. Center: H. P. Macauley, Continental Oil Co., Denver; Harold Healey, Ohio Oil Co., Casper, Wyo., and Glenn Neilson, Husky Refining Co., Cody, Wyo., newly elected vice president of the association. Right: J. M. Cullen, Stanolind Oil & Gas Co., Casper; E. J. Sullivan, Casper, and Frank Fogarty, executive secretary of the association

Group Asks Federal Disclaimer of Submerged, Inland Mineral Rights

DENVER. — Congressional action disclaiming any right, title, or interest in petroleum and other resources underlying lands owned by the states or private individuals in upland areas as well as under tidelands, the ocean bed, and navigable bays and rivers was demanded by the Rocky Mountain Oil and Gas Association at its annual meeting here November 20 to 22.

The resolution was adopted following an address by Dean Terrill, Kerr-McGee Oil Industries, Inc., Oklahoma City, in which he declared the doctrine by which the Supreme Court upheld federal claims to California tidelands could easily be extended to permit the federal Government to take over inland oil properties.

H. A. Stewart, Rocky Mountain manager for The Texas Co., was elected as president of the association for the coming year. Glen Neilson, president, Husky Refining Co. Cody, Wyo.; R. D. Smith, Union Oil Co. of California; and Charles S. Hill, independent operator of Denver, were made vice presidents. H. C. Thompson, British-American Oil Producing Co. at Casper, was made treasurer, and Frank Fogarty was reelected executive secretary of the organization.

James Donoghue, president of Mackinnie Oil & Refining Co., Denver, and retiring president of the association, presided at the annual sessions. More than 500 members attended the meeting, although storms throughout the Rocky Mountain states reduced the expected attendance. Representatives of the Independent Petroleum Association of America, Interstate Oil Compact Commission, American Petroleum Institute, New Mexico Oil and Gas Association, Western Oil and Gas Association, Mid-Continent Oil and Gas Association, and Montana Oil and Gas Association were present at the meeting.

Important Committee Reports

Committee reports, particularly of the public lands and legal and legislative committees, were an important feature of the convention. Following the report of the lands committee, headed by Frank Gower of The Texas Co., the association passed a resolution recommending that Congress enact a bill clarifying Section 36 of the Mineral Leasing Act, which concerns the fixing of price for Government royalty oil. The joint public lands and legal and legislative committees of the association reported on progress of federal and state leasing programs being sponsored by the association. In reviewing activities of the committee attention was called to the revision of federal lease and unit-agreement forms. Representatives of the Western, New Mexico, Mid-Continent, and Montana associations have worked with the committee to form a joint recommendation for these matters. Arrangements are now being made for a hearing in Washington for the purpose of discussing the federal lease and unit-agreement forms with representatives of the Department of the Interior. These two committees have closely cooperated with land officials of the various states in the Rocky Mountain region, and several favorable changes have been made in state oil and gas leases as a result of this work.

James L. Donnelly, executive vice president of the Illinois Manufacturers Association, Chicago, spoke to the convention on "What the Industrial Association Means to Management," and following the address there were informal discussions on tax matters concerning the oil industry. He urged business men to support their trade associations and through them to keep in close touch with government activities and express the views of industry before legislative and administrative forums.

The need for public-relations programs by the industry was stressed by Donnelly and he said that the petroleum industry offers an unusual opportunity for a public informational service.

Friday afternoon E. J. Gallmeyer, vice president of Wayne Pump Co., Fort Wayne, addressed the group on "Salesmanship—The Music of Business." Gallmeyer represented the Fred Eldeen Organization, public-relations consultants for the A.P.I.

The Supreme Court's tidelands decision, Terrill said in a detailed analysis of the case, "was, in effect, a title-jumping case and an attempt to force the uncompensated transfer of ownership by judicial decree of a very considerable portion of the resources of the state of California; and by reason of the principles asserted by the Government, a decision favorable to the United States would likewise make subject to federal ownership, dominion, or control property of inestimable value in every state."

this week

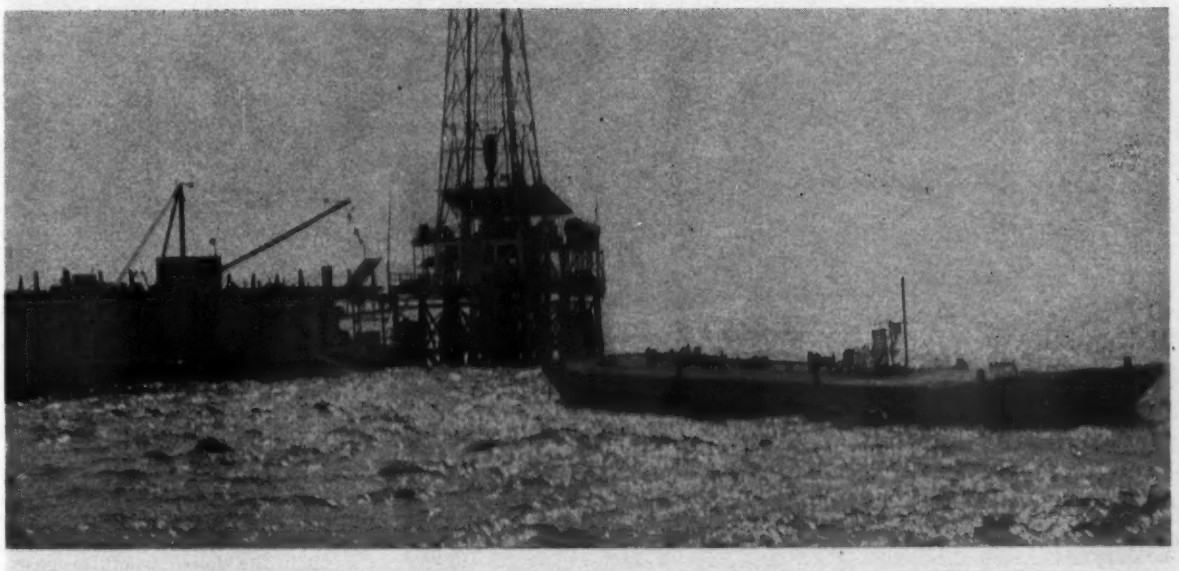
TRENDS—Crude-oil production during week ended November 22 averages 5,314,450 bbl. daily, an increase of 11,405 bbl. daily from the previous week and only 3,565 bbl. daily below the all-time high set during week ended October 25. . . . ¶Well completions during week total 717, an increase of 12. . . . ¶Wildcats total 117, an increase of 17 from previous week. . . . ¶Increase noted in runs to stills with daily average of 5,229,000 bbl. daily during week ended November 15. . . . ¶Runs during week ended November 8 average 5,189,000 bbl. daily. . . . Week ended November 16 a year ago averaged only 4,706,000 bbl. daily. . . .

GOVERNMENT—Congressional action giving up federal title to mineral rights in submerged lands, both offshore and inland, demanded by Rocky Mountain Oil and Gas Association. . . . ¶Government urged to put idle tankers into immediate use by NPC committees on tanker transportation and petroleum supplies. . . . ¶Federal Government also asked by NPC committee to maintain ice-free channel in the Illinois Waterway this winter. . . . ¶Sun Oil Co. serves notice it will appeal court ruling which held Justice Department need not answer Sun's interrogatories in Mother Hubbard case. . . .

INTERNATIONAL—Reports indicate newly discovered Buqqa field, 20 miles from Saudi Arabia's Abqaiq field, may have reserves exceeding 2,000,000,000 bbl. . . . Daily flow from Buqqa producers may be greater than largest producers in other fields. . . . ¶Creole Petroleum Corp. sets another all-time production record with daily average of 604,127 bbl. in October. . . . ¶Contract reported signed with American firm for construction of 2,500-bbl. refinery at Belem, Brazil. . . . ¶Acute gasoline shortage threatens complete disorganization of motor-transport system in France. . . . ¶Colombian House committee passes bill creating government concern to enter all phases of petroleum industry. . . .

PIPE LINE—Staking out of the 1,040-mile route from Abqaiq oil field in Saudi Arabia to a Mediterranean terminus on the Lebanese coast for Trans-Arabian Pipe Line Co.'s Middle East 30 and 31-in. line is nearing completion. . . . ¶Laying of the 253-mile Midland-Wichita Falls section of the 500-mile Jal, N. M.-Cushing, Okla., crude-oil line scheduled to begin this week. . . . ¶Magnolia begins test runs through its new 178-mile, 12-in. Beaumont-Hearne, Tex., products line. . . . ¶Interstate Oil Pipe Line Co. begins construction on 45-mile, 12-in. crude line in southern Oklahoma. . . . ¶F. W. Littell, Shell Pipe Line Corp., requests FPC to create new petroleum radio service covering pipe-line and production stations alike. . . .

HEARINGS—Tax "privileges" of co-ops attacked in House ways and means committee hearing. . . . Richard N. Cooper, Derby Oil Co. official, declares expansion of co-ops, possible through tax savings, threatening existence of independent business. . . . ¶House armed services subcommittee to open hearing December 1 on position of domestic synthetic rubber industry in national security. . . . To lay basis for legislation outlining national rubber policy. . . . ¶Wherry committee hears conflicting testimony on efforts of industry to allocate short supplies of essential petroleum products. . . .



Shown above is the first open water, offshore oil well in the Gulf of Mexico. Kerr-McGee Oil Industries, Inc.-Phillips Petroleum Co.-Stanolind Oil & Gas Co. No. 1, Block 32, Louisiana State Lease 754. After producing 2,500 bbl. of oil into the barge during tests which showed a flowing rate of 30 to 40 bbl. per hour, the well was shut in temporarily. It is located about 12 miles offshore from Point Au Fer, Terrebonne Parish, Louisiana, in 18 ft. of water. A hearing will be held shortly by the Louisiana State Conservation Board in Baton Rouge, at which plans for future drilling will be worked out. Arrangements are being made with the U. S. Coast and Geodetic Survey about markers in the water. *For more detailed story, see page 107*

G. N. Hile chief engineer, gasoline and cycling plants, The California Co., New Orleans; Fred H. Hayes, Clark Bros. Co., Inc., Houston; T. B. Flood, vice president in charge of drilling and production, and J. W. Hoover, vice president in charge of exploration, The California Co., New Orleans; H. C. Teasdel, president, The California Co., New Orleans; R. D. Morgan, plant superintendent, Cranfield, Miss.; Gov. Fielding L. Wright, Jackson, Miss.; K. H. Crandall, vice chairman, board of directors, The California Co., New Orleans, and E. J. Hudson, Hudson Engineering Co., Houston. Picture was taken during inspection trip through the new gas-cycling and pressure-maintenance plant at Cranfield

Mississippi's First Gas-Cycling Project Formally Dedicated

by Neil Williams

NATCHEZ, Miss.—Dedication ceremonies marking the inauguration of Mississippi's first gas-cycling and pressure maintenance project were conducted in Cranfield field, 15 miles east of here Friday, November 21. More than 400 state and county officials, representatives of operating and royalty interests in the field, and civic club and community leaders of surrounding cities and towns were guests of The California Co., the operating company, at the occasion.

Symbolic of the conservation of oil and gas resources of the field that will result from operation of the project, Gov. Fielding L. Wright, one of the honor guests, threw a switch closing the valve which cut off the flow of gas to the flare. Following this, guests were escorted on an inspection tour of the new plant.

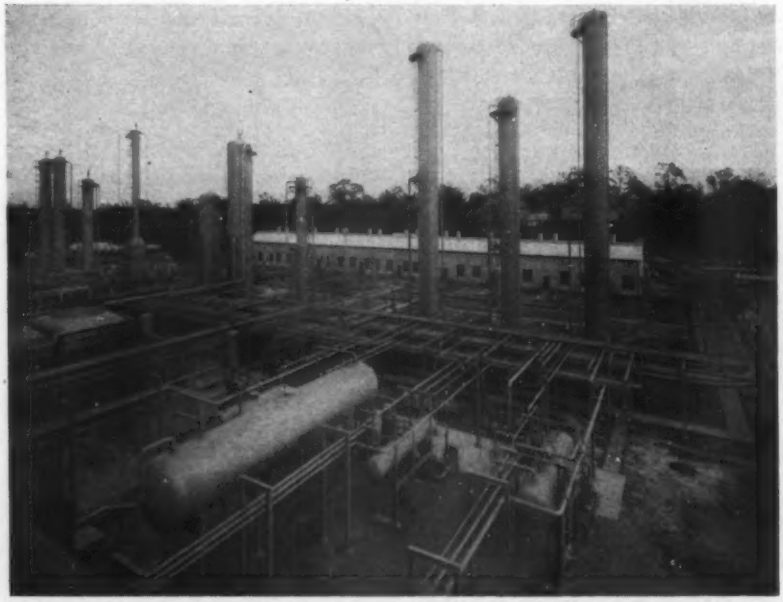
Previously, H. C. Teasdel, president of The California Co., proclaimed the inauguration of cycling and pressure-maintenance operations at Cranfield as a significant milestone in the petroleum industry's program in Mississippi.

On the short speaking program were H. T. Richardson, chief development geologist of the company, who discussed the general geological characteristics of the field, and Earl M. Kipp, chief petroleum engineer, who explained some of the operating phases of the project.

Companies participating in the operation of the project include The California Co. with 76.4 per cent interest, and Gulf Refining Co. and Placid Oil Co. holding the remaining 23.6 per cent interest. Unitization embraces both crude-oil and gas-producing areas and combines them in a single project.

The gas-cycling and pressure-maintenance plant, costing more than $4,250,000, is designed to process 100,000,000 cu. ft. of gas daily. It operates at an absorption pressure of 1,600 psi. and returns residue gas to the producing reservoir at a pressure of 4,000 psi. Products, in addition to 40° - A.P.I. - gravity, stabilized crude oil (processed at the plant), consist of rectified condensate, 32-lb. natural gasoline, and propane. In design and operation the plant is similar to the plant recently placed in operation by The California Co. in Lake S. John field, about 25 miles west across the Mississippi River in Concordia and Tensas parishes, Louisiana. *(A complete description of the latter project will be published in next week's issue of The Oil and Gas Journal.*

Involved in the project is the basal (Massive) Tuscaloosa sand found at subsea depths of approximately 9,900 to 10,000 ft. with surface elevations ranging from 245 to 400 ft. The field embraces approximately 9,500 acres, consisting of an oval-shaped gas-cap area with a relatively narrow crude-oil rim in the down-structure phases. There are approximately 60 crude-oil producing and 7 gas and high-ratio gas-distillate wells tied into the system.



Gas-cycling and pressure-maintenance plant recently placed in operation by The California Co. in Cranfield field, Adams County, Mississippi. Portion of vapor-recovery system is shown in foreground with compressor plant in background

New P.E.P.A. officers and directors include, left to right, C. L. McNeese, Houston Lighting & Power Co., Houston; L. V. Dugas, Gulf States Utility Co., Beaumont; A. R. Watson, Southwestern Public Service Co., Amarillo, president; R. E. Patrick, Kansas Gas & Electric Co., Wichita; Paul Griffith, Arkansas Power & Light Co., Little Rock; B. F. Thompson, Public Service Co. of Oklahoma, Tulsa; and J. B. Moore, Northern Indiana Public Service Co., Hammond, Ind., secretary-treasurer

Oil-Field Uses of Electric Power Discussed in P.E.P.A. Conference

by Ed Short

CORPUS CHRISTI. — The intrinsic energy of the dissolved gas and the producing bottom-hole pressure must always be considered in the selection of production methods, John G. Calvert, district petroleum engineer at Overton, Tex., for Humble Oil & Refining Co., told the nineteenth annual conference of the Petroleum Electric Power Association here last week.

Two factors often overlooked, and which account for extensive use of electric power by some companies in East Texas field, are, he said, these inherent characteristics of electric motors and gas engines: (1) an electric motor only requires and consumes the horsepower that is actually required to operate the particular equipment to which it is connected, and (2) a multicylinder gas engine costs about the same to operate with a very light load as it does up to and slightly above the normal ratings on engines for continuous duty.

More than 80 members and guests from 10 states attended the conference. The association is composed of 26 utility companies which furnish a substantial amount of the electric power used by the oil industry.

One of the principal speakers on the opening day of the conference was John F. Lynch, president of La Gloria Corp. and Reynosa Pipe Line Co. and a director of Carthage Hydrocol, Inc. In discussing the industrial development of the Gulf Coast area, Lynch described the hydrocol plant in Brownsville, Tex., as one of the most interesting phases of South Texas industrial development. This $20,000,000 plant, in which eight companies are interested, will produce motor fuels and other liquid products from natural gas.

G. R. Rice, vice president of Tennessee Gas Transmission Co., Houston, spoke briefly upon his company's use of purchased electric power, which is largely for cathodic protection of pipe lines. According to Rice, the most interesting electrical development in T.G.T. operations is its new Kentucky station, which is equipped with three centrifugal compressors driven by 2,000 to 900 r.p.m., 4,000-volt induction motors. "This plant," he pointed out, "cost considerably less to build than a reciprocating set-up."

During the Friday session, H. K. Ihrig, technical service manager of the Mid-Continent division of Kobe, Inc., discussed the newly developed free pumping system, pointing out that power oil installations were often powered by electric motor drive.

Other speakers during the conference included: E. A. Armstrong, manager of industrial sales, Public Service Co. of Northern Illinois, Chicago; George A. Mills, superintendent of power plants, Central Power & Light Co., Corpus Christi; D. H. Levy, general superintendent, telegraph and telephone, Magnolia Pipe Line Co., Dallas; Ray K. Glenn and T. A. Workman, Glenn Advertising, Inc.; J. F. Collerain, Houston Pipe Line Co., Houston; A. R. Watson, vice president, Southwestern Public Service Co., Amarillo; and C. L. McNeese, Houston Lighting & Power Co., Houston.

Most Interim-Aid Oil to Come From Outside U. S.

More than two-thirds of the oil required under the stop-gap aid program for Austria, France and Italy is to be procured from offshore sources, under the Lodge amendment to the interim aid bill now before Congress.

Opening debate in the Senate November 24, Sen. Arthur M. Vandenberg of Michigan disclosed that offshore oil purchases will amount to $18,000,000 for France, out of $22.000,000 needed, and $8,000,000 for Italy, cut of $13,000,000. The $1,000,000 worth of petroleum required for Austria presumably will be obtained, at least to considerable extent, in this country.

A provision of the bill stipulates that not more than 25 per cent of the $597,000,000 proposed to be appropriated shall be expended outside the country, but that is an over-all limitation which would in no case apply to oil since it is followed by a provision that procurement of petroleum and products shall be made from sources outside the United States "to the maximum extent practicable."

First of Idle Tankers To Be in Use Next Week

The first of the 96 T-2 tankers now being reconditioned by the Maritime Commission are expected to go into service about December 1 to relieve the New England oil shortage, Sen. Henry C. Lodge, Jr., of Massachusetts, declared Tuesday following a conference with Commissioner Richard Parkhurst. The 96 ships were ordered reactivated October 10.

International

WORLD-WIDE OIL DEVELOPMENTS

Shell Preparing to Supply European Specialty Demands

by Arch L. Foster

FORESEEING apparently a tremendous postwar growth in European consumption of petroleum chemicals and allied products, the Royal Dutch-Shell group is developing far-reaching plans for providing manufacturing capacity for a long list of chemical products and petroleum specialties.

These plans include new manufacturing and chemical plants in England and Holland and the broad expansion of existing facilities, some of which were started about the time of the outbreak of the war.

The products from these plants include intermediate and associated chemicals for synthetic products of various types, demand for which will increase as industrial Europe regains its productive capacities in the next few years. Alcohols, acids, solvent materials, soap substitutes, detergents and similar materials, insecticides, fungicides, and agricultaural chemicals and fertilizers are among the expanded list of products.

In England, construction already is under way on a specialized refinery at Thornton-le-Moors. The plant, on an 85-acre site, is scheduled to be completed in 1948. It will have a capacity of 24,000 tons per year of a variety of chemical products.

The process is built around the thermal cracking of certain raw materials of petroleum origin at temperatures as high as 1,300° F. to produce ethylene, propylene, butenes, and other olefins as intermediates for further synthesis. From these olefins will be made acetone, methylethyl ketone (MEK), and other ketones; alcohols such as isopropyl, diacetone, secondary and tertiary butyl; ethers such as i-propyl ether, and many other products for European industries, especially British. Benzene, toluene, xylenes, and other aromatics will be produced in quantity, also, as one group of products from the thermal decomposition of the raw materials processed, which will be used later for the synthesis of numerous other organic chemicals. Most of the products made in this plant will be purified to 99 per cent or higher.

Because the conservation of manpower in Britain is of primary importance, automatic control will play a large part in the operation of the plant. Some 200 people will be required for the entire staff, including office and clerical workers; the product value per employe will be among the highest in British industry.

Ester salts plant of Royal Dutch Shell at Stanlow, England. Above the barrels, used for the finished product, may be seen the redistillation and solvents recovery unit. (Picture courtesy Shell Photographic Service, London)

Associated Specialty Plants

Existing specialty plants associated with this new unit are the refinery at Stanlow on Manchester Ship Channel and the one at Shell Haven, on Thames estuary. The Stanlow plant already produces some 24,000 tons annually of sodium alkyl sulfates, cracking paraffin waxes to form the higher olefins. These sulfates are employed as wetting agents, as domestic soap substitutes, and in many other uses. The Stanlow plant was started during World War II at 12,000 tons per year, its products replacing those formerly imported mainly from Germany. It is at present the only petroleum chemical plant in Great Britain, and the expanded facilities planned will bring the total capacity to 50,000 tons per annum by mid-1948.

The Shell Haven unit is producing mainly insecticides, fungicides, and other agricultural products, and the planned expansion is expected to boost the capacity to about 30,000 tons per year. In connection with

this development, an experimental farm of 170 acres has been acquired at Woodstock, Sittingbourne, in Kent.

Expansion of the Shell Research Centre facilities at Thornton, England, is planned also. This center was established just before the war, and after loss of the Amsterdam laboratories the Thornton installation was increased.

In Holland two new factories are being planned near the Pernis oil refinery. One of these plants will make synthetic resins and plastics and will have an annual product output of approximately 2,000 tons, starting about the end of 1948. The products will be based on vinyl chloride and vinylidene chloride, which have not been used for these purposes in Holland heretofore.

The second unit will produce synthetic detergents, soaps, and soap substitutes, and will synthesize some 25,000 tons annually of these materials. The unit will derive much of its raw material from the crude produced at Schoonebeck, 3,800 bbl. per day, which is high in paraffin wax content, the raw material needed for manufacturing sodium alkyl sulfates for detergents.

During the war the Germans took much of the equipment used at the fertilizer factory at Ymuiden, Holland, operated by a Shell affiliate (Mekog) so that the unit, producing 16,000 tons of nitrogenous products before the war, has been able to operate at about 50 per cent capacity since early 1946, and that only by temporary arrangements. Cooperating with the government in the effort to meet the serious fertilizer requirements of Europe this unit will be expanded to a capacity of more than 50,000 tons per annum by mid-1949, manufacturing calcium ammonium nitrate. These two new Pernis units will require the expenditure of at least 179 million florins.

Another Abqaiq Seen In New Buqqa Field

UNOFFICIAL indications point to fact that the recently-discovered Buqqa oil field, 20 miles northwest of the Abqaiq field in Saudi Arabia, "may be another Abqaiq." Abqaiq's probable crude-oil reserves are upwards of 4,000,000,000 bbl.

Three oil wells in Buqqa have been brought in, but not tested. Currently, four more are being drilled. As of late October, these wells were down to approximately 4,750 ft. The discovery well was in the Arab zone and there is still some difference of opinion among Arabian American Oil Co.'s geologists whether the pay in Buqqa is in the Lower Cretaceous or Upper Jurassic.

Evidences are that the daily flow from the Buqqa wells may be greater than Aramco's largest producers in its other fields. Buqqa's probable reserves, at present, are thought to be about 2,000,000,000 bbl. However, the field has not been defined.

Discovery of the Buqqa field is part of Aramco's over-all program to step up Saudi Arabian crude-oil production, which will be put through the Trans-Arabian 1,040-mile pipe line, slated for completion early in 1950. In the Qatif field, Aramco currently is drilling six additional wells, with projected depths of about 7,500 ft. Saudi Arabia's current production is about 264,000 bbl. daily. *(For details on progress of the line, see page 100).*

Bill to Create Colombian Oil Concern Passes House

The house oil committee in Colombia's Congress has approved, at first reading, a bill creating Empresea Colombiana de Petroleos, an official oil enterprise to engage in all branches of the petroleum industry.

To finance this enterprise, the government proposes to collect about $5,700,000 annually through surface fees, pipe-line taxes, oil fines, and fuel depot fees.

Meanwhile, another Colombian bill calling for patrimony-tax exemption for oil and mining during exploration and an income tax depletion deduction of exploratory expenses incurred prior to the commercial period has been submitted to congress in an effort to stimulate the search for oil and minerals in Colombia.

Creole Output Again Sets All-Time Record

Creole Petroleum Corp.'s October production hit a new all-time high with an output of 604,127 bbl. daily. This compares with September's production of 600,215 bbl. daily.

The company's refinery crude-oil throughput for October was 70,063 bbl. daily, compared with 57,659 bbl. daily for September. Of the October throughput, 60,265 bbl. daily was at Caripito and 9,798 bbl. daily at La Salina.

October's 604,127-bbl. figure indicates that 440,442 bbl. were from Lake Maracaibo area; 10,177 bbl. from Mara district and Cumarebo; and 153,508 bbl. from Eastern Venezuela.

Fifteen development wells and six exploratory wells were completed, and except for three exploratory wells, all were oil producers. Two of the dry holes were in the Guarico area and one in Jusepin. The fields where the producers were brought in, their average initial production and depth follow:

Development wells: Quiriquire, six, 620 bbl., 4,050 ft.; Bolivar Coastal (B.C.F.), three, 744 bbl., 4,078 ft.; Mulata, two, 216 bbl., 4,976 ft.; Cumarebo, one, 30 bbl., 1,740 ft.; Jusepin, one, 160 bbl., 4,335 ft.; Temblador, one, 213 bbl., 3,971 ft.; and Tucupita, one, 278 bbl., 5,773 ft.

Exploratory: Bolivar Coastal (B.C.-F.), one, 1,386 bbl., 6,674 ft.; Jusepin, one, 200 bbl., 5,850 ft.; and Mulata, one, initial production undetermined, 5,555 ft.

Monthly average—	Supplies of crude oil
1938	580
1946	242
First half 1947	379
July	439
August	480

Acute Gasoline Shortage Felt in France

FRANCE is threatened with complete disorganization of her motor transport system, as a result of the acute shortage of gasoline, unless new U.S. credits enable that country to increase her gasoline imports, according to a Reuters dispatch from London.

As the postwar reconstruction of French refining capacity has not yet been completed, France must rely largely on imports of gasoline and various other petroleum products. In recent months, French refineries have produced a monthly average of only 110,000 to 120,000 tons (770,000 to 840,000 bbl.), compared with 200,000 (1,400,000 bbl.) in 1938.

Imports, after rising to 217,000 tons —their highest point—in March of this year, fell to 12,000 tons in July and 15,000 tons in August. In 1938, about 57,800 tons of gasoline per month were imported.

Short supplies have caused inroads into visible gasoline stocks, which, after rising to their highest point of 427,000 tons at the end of April 1947, fell to 198,000 tons at the end of August and to 158,000 tons in the middle of September, which is equal to little more than 1 month's supply.

The following statistics, in thousands of tons, give a clear picture of the drop in gasoline imports. (A ton is roughly equivalent to 7 U.S. bbl.)

	Imports of petroleum products*	Production of French refineries*	Total supply of petroleum products*
1938	87	348	435
1946	189	176	365
First half 1947	200	287	487
July	66	325	391
August	51	298	349

*Gasoline, gas oil, fuel oil, and paraffin.

No. 2 pump station on the pipe line between Poza Rica field and the Atzcapotzalco refinery, in the federal district near Mexico City

Reentry of American Oil Capital Into Mexico Virtually Assured

by Warren W. Burns

REENTRY of foreign oil capital into Mexico may be brought about in the comparatively near future, according to many current and apparently reliable reports from Washington and Mexico City concerning a mutual desire on the part of both governments, as well as private oil interests in the United States, to arrive at some satisfactory solution of the problem.

It is known that at least one high Mexican Government official has approached the U.S. State Department to "sound out" State Department sources on this matter. And this Mexican official was not merely talking about production work such as might be carried on by a United States drilling contractor for the Mexican Government. Rather, it is understood, the Mexican Government official evidenced interest as to exactly on what basis private United States oil companies would consider spending venture capital once again on Mexican soil.

The interest which the U.S. Army and Navy have shown in an intensified oil-development program throughout the Western Hemisphere, coupled with the fact that the Mexican petroleum industry is almost certainly heading toward a production crisis within the next few years, leads well-informed sources to believe that some satisfactory solution can and will be found—for the joint benefit of the Mexican Government and private outside interests.

In seeking opinions from various United States oil companies which might be interested in Mexican oil production, the State Department has found that many of them point out the need for changes which would permit contractural relationships, between the Mexican Government (Pemex) and foreign-owned companies, under which the latter could participate in any production found. Specifically, it is said that Article 10 is the greatest barrier, for this article contains the restriction whereby petroleum contracts can be made only with Mexican individuals and with Mexican companies composed exclusively of Mexican citizens. The elimination, throughout the Petroleum Law, of any reference to Mexican nationality also is deemed necessary.

In this connection, it is pertinent to mention that the expropriated U.S. oil companies have received full compensation and they consider the expropriation matter a closed chapter. The British oil interests also have terminated an agreement whereby they are to be reimbursed. All expropriated companies are known to understand fully the undisputed ownership of the subsoil by the Mexican Government and presumably would favorably consider some future relationship with the Mexican Government on mutually beneficial operating basis—if made permissible by law.

If the Mexican Government desires

Drilling well in Poza Rica field, which has not yet been fully defined

the return of outside capital, it is thought that in amending Article 10, it should be so worded that any reference to contracts mentioned in previous articles would not specify a nationality.

In a well-documented article in a recent issue of the "Mexican-American Review," John J. Slattery, a veteran American oil man in Mexico, points out that Petroleos Mexicanos (the Mexican Government oil monopoly) has been attacked unjustly. And in explaining his position, Slattery states that since the expropriation of foreign oil properties in 1938 the cost of living has zoomed upwards, with the result that in 1946 Pemex had expenses three times what they had been previously. And that in the first flush of enthusiasm Pemex workers were granted certain concessions which later proved uneconomic, but which, in many instances, were not withdrawn. Furthermore, he states:

"The current administration (directed by able Antonio J. Bermudez) is making every effort to place Pemex on an efficient operating basis. Much of the oil monopoly's wastage and inefficiency has been corrected. But no matter how successful the Aleman Government is in correcting Pemex's surface defects, the foundations of Mexico's oil industry will remain shaky until a large-scale exploration program is undertaken and the billions of barrels of Mexican petroleum still undiscovered are tapped by wildcatters."

In connection with Mexico's untapped reserves, it is interesting to note that one of the leading international geologists has privately told friends that in his estimation the world's greatest petroleum reserve, bar none, is between Brownsville, Tex., and Mexico's Poza Rica field.

E. DeGolyer, well-known geologist in the United States and throughout the world, has been retained by Pemex on a consultative basis. DeGolyer indicated that the following areas, with the following projected depths, should be intensively developed to increase Mexico's crude-oil production:

Central western section of Lower California, from 8,000 to 9,000 ft.; entire state of Tabasco, almost extreme southeast section of Mexico bordering on Honduras, to 7,000 ft.; and central and northern section of Tamaulipas, which borders on Texas, to 10,000 ft.

Certain Guarantees Needed

In stating that foreign capital needs certain guarantees, Slattery stated that if it is offered adequate investment terms, foreign capital will "pour vast sums into the Mexican oil industry." Furthermore, he states, "one must remember that an investment of $50,000,000 yearly in drilling exploratory wells means other large sums spent on preliminary explorations and—once a new field is discovered—many more millions invested in pipe lines, refineries, terminals, etc."

Should foreign capital be invited to make such huge investments, Slattery states, foreign capital naturally "would need the assurance that it would be allowed to operate on a reasonable profit-sharing basis."

And briefly, this appears to be the greatest concern of almost all United States oil sources interested in entering Mexico on some type of concession arrangement—"to operate on a reasonable profit-sharing basis."

Another important change that would have to be made in Mexico's 1941 Petroleum Law, before foreign oil interests could operate on a concession basis, is in Article 8. This article contains a provision whereby no outside company or individual may hold shares in a Mexican company operating within the prohibited zone. This zone covers an area within 100 kilometers (62 miles) of the border and within 50 kilometers (31 miles) of the seacoast. Obviously, this prohibition would have to be eliminated in order to allow outside individuals or companies to seek concession rights within the now prohibited zone, as it is thought that a large part of Mexico's probable crude oil reserves are in these areas.

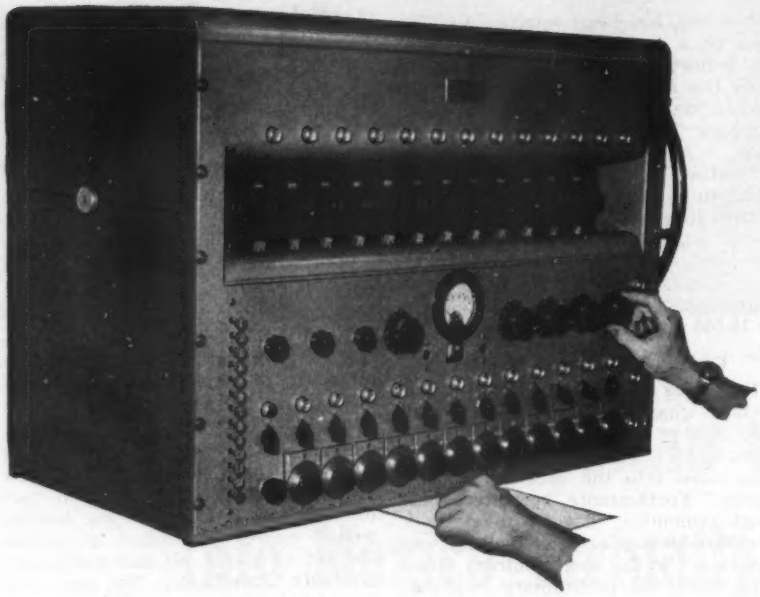
Assuming that Mexico's 1941 Petroleum Law might be amended, as explained above, there is still another barrier to be hurdled in that foreign oil interests entering Mexico would expect to export a certain amount of crude oil and petroleum products. Specifically, the tax rates would have to be revised downward, for with the large-scale development of crude oil in Mexico, Mexican crude and petroleum products would be in a competitive position with crude oil and petroleum products from other parts of the world.

Exactly how the 1943 tax decree—which more than doubled the production tax rate on all oil exported over and above the first 4,000,000 bbl. per year—affects current Mexican operations is not exactly plain, as Pemex is the only exporter. However, assuming the entry, or reentry, of United States or British oil interests, the present tax structure necessarily would have to be revised.

The importance of exporting crude oil and/or petroleum products, in so far as the Mexican Government is concerned, cannot be overemphasized. For instance, Mexico's Panuco crude, with its high asphaltic content, brings a good price in foreign markets. If refined domestically, its quality would be largely wasted. Mexico is desperately in need of U. S. dollars to help offset an unfavorable trade balance. And, from a strictly refining viewpoint, there are certain products not in great demand within Mexico, and the obvious answer is export.

The vital importance for some type of aggressive action, by the Mexican Government, is highlighted by the undisputable fact that Mexico's four major producing areas are, with the exception of Poza Rica, nearing the depletion stage. Poza Rica, which was discovered in 1930 and which has produced approximately 262,000,000 bbl. to date, is thought to be just approaching its flush production period. But the famous Golden Lane, the Isthmus fields, and the Panuco area—all of which have been producing for many years—are showing definite signs of a declining output. Poza Rica, with an estimated reserve of 1,000,000,000 bbl., has not had its limits defined.

Typical installation in Mexico's young producing areas, where derricks are removed as soon as the well is flowing properly



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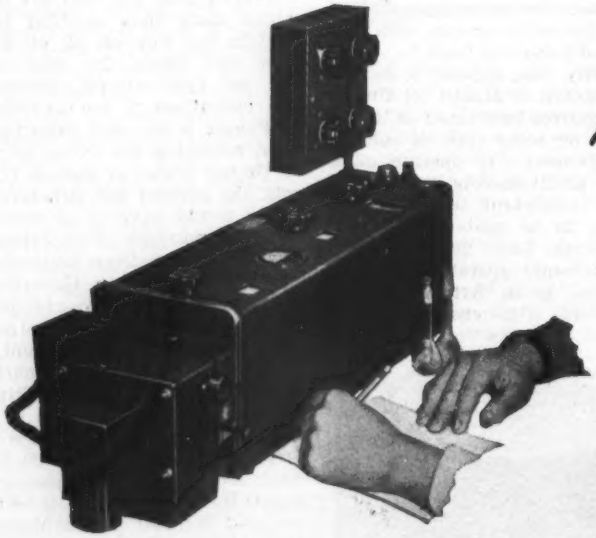

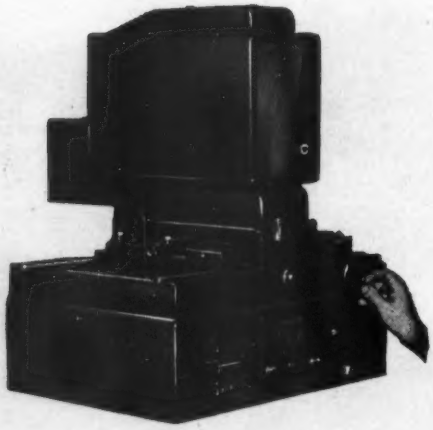

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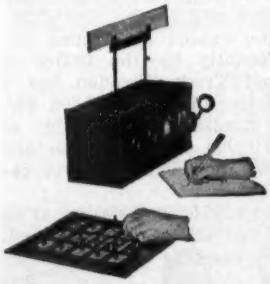

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WASHINGTON WATCHING

BY BERTRAM F. LINZ

Check on Europe's Oil

WASHINGTON.—Biggest problem in European-aid administration is how to avoid establishing a new bureaucracy and still make sure that billions of dollars worth of materials and products are produced and sent to needy nations with the least impact on our own economy.

So far suggestions advanced call for the creation of a new independent Government agency or a government corporation to handle the job, but in the highest levels of the administration thought is being given to the possibility of dealing with the problem through a small, compact organization which would keep close watch to see that no money was wasted but leave the actual procurement of oil and other commodities in the channels of normal trade.

The only stumbling block to this idea is the probability that by leaving oil procurement a matter of negotiation between the several European governments and the domestic industry, prices would be forced up—which would be equally probable in every industry dealing with the needs of Europe—but some officials believe that this would be preferable to the big organization that would be needed if procurement were handled through a Government agency.

Even under such a plan, however, it would be necessary to have men in the Government who could watch the industry to know what and where supplies could be procured, to guard against exports which might deprive domestic consumers of needed products. However, it is felt, this is preferable to setting up another PAW with control powers over the country.

Tidelands Action Lags

CHANCES that legislation returning the California tidelands to the state will be taken up by Congress during the special session are dim.

Consideration of the measure will not be started until the Association of Attorneys General which, with the exception of the representatives of Alabama and Missouri, voted to support the legislation, is ready to appear at what may turn out to be lengthy hearings before the Senate judiciary committee. Attorney General Tom Clark informed the committee he is ready to appear any time.

Because of the new situation created by the Supreme Court decision, the original legislation to quitclaim all Government title to the California offshore lands is believed now not to be adequate. A new measure, for one thing, would have to outline what lands are covered.

Meanwhile, the Government is going ahead with the drafting of the legislation for the disposition of the California oil lands, to be enacted if their return to the state is defeated.

All of the departments interested in the matter at taking a whack at it, and before the final draft is prepared it will be necessary to settle whether the offshore fields are to be turned into a national petroleum reserve, as the military are expected to urge, or to be designated as public lands under the Interior Department.

The term "Naval Petroleum Reserve," by the way, is no longer held in esteem. With the merger of Army and Navy and a broadened concept of national security, oil reserves are now considered to be "national" rather than "naval."

Fuel Oil Duty Puzzles

THE $64 question in the big reciprocal trade agreement announced last week is the meaning of a proviso appended to the item cutting the import tax on topped crude and fuel oil.

That proviso, not mentioned in the 230-page "summary" of the agreement released by the State Department, but found in the official four-volume agreement, states that:

"In no event shall the rate of import tax applicable under Section 3422, Internal Revenue Code, or any modification thereof, to topped crude petroleum or fuel oil derived from petroleum be less than the rate of such tax applicable to crude petroleum."

Just what the provision means appears to be anybody's guess pending the return to Washington of the legal luminaries who participated in the negotiations at Geneva, but a message has been forwarded to them to bring back the answer.

The present import tax on crude oil is ¼ cent per gallon, the same as the new rate set for fuel oil, and in some Government circles the view was taken that the proviso may mean one of three things:

1. That both rates are now bound and that on crude cannot be increased, or

2. That any reduction which might be made on crude in the future will not automatically extend to fuel oil.

3. That should Congress at some future date determine that too much crude is being imported and increases the import tax, the rate on fuel oil will automatically be increased.

Officials agree that the negotiators must have had "something" in mind when they drafted the proviso, but would hazard no guess as to what that "something" was.

The third interpretation of the provision, however, was held to be the most plausible, since it is in the nature of a protective clause. Should the rate on crude be increased, it was pointed out, it would not do to have a lower tax on a finished product than on the raw material from which it was made.

Cartels Under Scrutiny

THE Government's policy toward participation of American companies in foreign oil cartels may be clarified following official study of a document expected to reach Washington in the near future.

This is a translation of an official Swedish report now being prepared which is said to disclose that two American companies are parties to an agreement dealing with oil supplies for Sweden.

The information is said to have been disclosed under a Swedish law requiring the registration of cartels. The American companies did not file, but the Swedish participants refused to take a chance of prosecution and registered.

The registration law was an outgrowth of an unsuccessful effort to nationalize the Swedish oil industry. Foreign companies operating in Sweden—the two American companies are reported to control about 80 per cent of imports—were not making much headway in fighting nationalization, when they were joined by the cooperatives whose weight swung the balance.

Now, with the cartel registration act, the cooperatives appear to be preparing to expand their activities, and it was reported that two tankers from Sweden recently arrived on the Gulf Coast to load products already in tanks awaiting them.

Under the export allocations announced recently by the Office of International Trade, Sweden has a fourth-quarter quota of 242,500 bbl. of motor gasoline, 100,000 bbl. of kerosine, 310,000 bbl. of gas oil and distillate oil and 150,000 bbl. of residual fuel oil.

There already is speculation as to what the Department of Justice will do when it receives a copy of the

"Oilwell's" No. 36-P Triplex Water-Flooding Pump, which has proven so successful in the water-flooding areas of the East, now enters the Mid-Continent fields.

Illustrated are three "Oilwell" No. 36-P Triplex Pumps, installed near El Dorado, Kansas, in April, 1947, which maintain a 500 p.s.i.* discharge pressure with a combined capacity of 7000 barrels of water per day.

*2800 p.s.i. maximum discharge

Wherever Water-Flooding Problems Exist *There* You Will Find "OILWELL" No. 36-P TRIPLEX PUMPS

- The first "Oilwell" No. 36-P Pump was installed in Pennsylvania back in 1943.
- Since this initial installation, more and more of these pumps are giving outstanding service under continuous operating conditions in the water-flooding areas of the East.
- Now numerous installations are also being made in the relatively recent water-flooding projects that are beginning to get under way in Kansas and Oklahoma.

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OUTSTANDING ADVANTAGES OF THE NO. 36-P PUMP WHERE CONTINUOUS OPERATIONS ARE NECESSARY:

1. This pump is equipped with sufficient valve capacity for operating at high speeds.
2. Triplex construction gives a much smoother and more even discharge pressure than is obtainable from a duplex type pump.
3. The gear and pinion assembly is enclosed in an individual housing, and designed for accessibility and easy repair without stripping crankshaft and pinion shaft assemblies.
4. Hardened and ground corrosion resisting plungers are sealed by grease lubricated chevron packing, which aids in reducing the necessity of parts replacement.
5. The enclosed power end of this pump is doubly protected against entry of mud or foreign materials.
6. A forced feed lubrication pump circulates oil to all wearing parts that are not oil bath or grease lubricated.

"OILWELL"

report showing that American companies are parties to a cartel arrangement. Up to not so long ago the State Department frowned upon efforts of the department to break up international arrangements which were of benefit to American concerns, but thinking among the diplomats now is very anticartel and they are all for breaking up agreements for the division of world business.

OGD May Expand

THE increasing responsibilities which will be imposed on the Oil and Gas Division as the industry seeks to bring production up to demand and meet the requirements for European aid will necessitate an increase in the appropriation for operation of the agency during the coming fiscal year, it is now believed in Washington.

The 1949 budget which President Truman will send to Congress in January is expected to carry $400,000 for the OGD, of which $225,000 will be for necessary expansion of its Washington office and $175,000 for enforcement of the Connally "hot oil" act. This would be an increase of $150,000 for activities other than "hot oil" enforcement.

With the development of the current shortage situation, the pressure on the OGD has increased tremendously. At the same time, its officials have taken an active part in the studies and discussions of the European aid program. Even in more normal times, however, the load on the office was heavy, as indicated by the 1,100 requests sent in by members of Congress between January 1 and August 15..

As a matter of fact, there is some doubt whether the OGD will be able to get through the current fiscal year on its present appropriation, and it certainly will not if the volume of work continues to mount. Consideration already has been given to the possible necessity of asking Congress for a deficiency appropriation so that the present limited staff may be augmented.

No Red MER

APPARENTLY following a set course of so depleting the resources of satellite countries as to make it impossible for them ever to show "insubordination" to Communist orders, Russia is rapidly exhausting the oil reserves of Romania and Hungary, according to reports reaching Washington.

At the same time, the Russians are said to be using similar wasteful methods in their own oil fields, with the result that the great expansion of production and use of petroleum planned by Red leaders is faltering.

No definite figures to substantiate these reports can be secured from behind the iron curtain, but even strict censorship has failed to halt the flow of veiled information to Geneva and other European points where all nations maintain "listening posts."

It is reported, for instance, that Hungarian production has dropped from nearly 15,000 bbl. daily last year to around 14,000 bbl. at the present time. Austrian output, some of which was scheduled for transfer to the American zone of occupation but never received, has dwindled similarly. Romanian production is a third less than prewar, and falling off steadily.

Within Russia, intensive efforts are being made to discover and develop new reserves to supplement present fields which are showing signs of exhaustion. Lack of modern machinery, however, is said to be handicapping this effort.

With American supplies shut off by export control, the strain on the Russian industry will increase. U. S. oil for delivery at Pacific Ocean points in Asiatic Russia, and imports from the satellite countries, have eased the situation while Russia was developing new indigenous sources.

Oilmen say that the Eastern European fields will not long continue to produce in quantity under Russian methods, which waste gas in the effort to get as much oil as quickly as possible.

Aramco Tax Status Eyed

TAX policies toward foreign subsidiaries of American corporations may be reexamined as a result of the Senate's recent investigation of the Saudi Arabian and Bahrein operations, which called attention to the fact that such companies pay no United States income taxes except on dividends distributed here, and can plow all profits back into the business.

Investigation of the possibilities of collecting taxes from $117,000,000 in profits accumulated by two foreign subsidiaries of American oil companies was suggested to Secretary of the Treasury John W. Snyder last week by Chairman Owen Brewster of the Senate war investigating committee.

Brewster recited the "somewhat unusual tax situation" uncovered during recent hearings on Navy purchases of oil from the Arabian American Oil Co. That situation, he said, arose out of testimony that the Bahrein Petroleum Co., a Canadian corporation, had profits $92,186,000, and the California-Texas Oil Co., incorporated in the Bahamas, had profits of $25,387,000, on which no taxes of any kind had ever been paid to the United States or any foreign government.

"The representatives of these oil companies, before our committee, stressed the American character of the enterprise and its significance to the United States, particularly from the tax angle," he commented.

"To what extent there are similar situations of this character affecting the tax position of American corporations operating abroad would seem to be a matter that might well invite exploration."

Brewster asked whether the Treasury is familiar with the situation and has any statistics as to the extent of "this practice"; whether there is any possibility of reaching profits of this character under existing law, and whether the Treasury has ever given consideration to any legislation dealing with a situation of this nature.

"Rights" vs. "Ownership"

THE "ownership" of California's tidelands remains a matter of debate, as the Supreme Court this week refused to modify the text of its decree that the federal Government has "paramount rights" in the off-shore oil fields.

Robert E. Lee Jordon, a California operator who seeks a federal lease on part of the disputed area, had petitioned the Court to change its language to make it clear that the United States is the "owner," saying that otherwise there will be extensive litigation.

Many attorneys say that the expressions "paramount rights" and "dominion," used by the Court in its tidelands decision, introduce new and novel concepts in American law which might be construed to give the federal Government control over oil beyond its actual ownership of oil lands. Some even argue that this language is more of a threat to inland states than if the Court had said the federal Government is the outright owner of the California coastal strip.

Now that the Court apparently has drawn an official distinction between "ownership" and "paramount rights" it has created even more of a puzzle as to what kind of federal control and leasing legislation can be presented to Congress.

Government Royalty Oil Sale Set for December 4

WASHINGTON.—The Interior Department will open bids December 4 for the sale of royalty oil from Montana and Wyoming fields, with preference to be given in making awards to owners of small refineries with insufficient supplies.

The department is offering approximately 3,200 bbl. of royalty oil monthly from Cat Creek field, Montana; 4,200 bbl. from La Barge field; 1,600 bbl. from Rock Creek field and 3,000 bbl. from South Elk Basin field, Wyoming, and 45,000 bbl. from Elk Basin field in Wyoming and Montana.

Registration Increase Heightens Interest in Road-Building Plans

WITH automobile registrations expected to exceed 30,000,000 vehicles by the end of the year—the highest in our history—there is renewed interest within the petroleum industry in a sound postwar road construction program. Scarcity of materials and full employment in the rural areas and urban centers have tended to postpone actual construction on part of the program as formulated at the close of World War II. Several phases of the plans for the future and their relation to the oil industry were discussed at the recent annual meeting of the American Petroleum Institute.

It is pointed out that not only is the number of car registrations returning to the prewar peak but actual use of motor vehicles has greatly increased, reflected in the data which reveal that domestic gasoline consumption so far this year has been about 20 per cent ahead of the same period of 1941. Observers stress that with a much larger consumption per unit in practically all types of motor vehicles and the number using the highways steadily increasing, the need for improved and enlarged highway systems is now greater than ever before.

An announcement of the past week by the National Highway Users Conference explained that 22 per cent of the federal highway funds were under contract October 1, 2 years after the first funds were made available to the states under the Federal-Aid Act. The dollar amount of the contracts awarded was $471,000,000 in federal funds for a total cost of $934,000,000 after dollar matching by the states. Programs submitted by the states including those under contract total $904,000,000 in federal funds. The total cost of programmed projects, including state matching funds, is $1,793,000,000 for 48,000 miles of construction.

At the Chicago A.P.I. meeting the petroleum industry was urged to take a more active part in national, state, and local road programs. Speakers stressed that through state and other excise taxes and registration fees the petroleum and automobile industries will largely pay for the new highways that need to be built with large expenditures required to maintain the systems already completed.

Surveys have shown the strong postwar position of all types of automotive transportation using highways. These investigations have revealed that new markets will be opened from which the petroleum industry will benefit through the expansion of all-year highways in agricultural sections which now have inadequate farm-to-market roads. Expanded trucking and bus operations as well as the needs of car owners emphasize the necessity of more national highway systems. It is also agreed that in all postwar highway planning national systems conforming to present-day requirements are an essential phase of national defense.

Government Action Recommended to Keep Illinois River Free of Ice

WASHINGTON. — Government action to maintain an ice-free channel in the Illinois River this winter was recommended last week by a special NPC committee headed by B. L. Majewski, Deep Rock Oil Corp., Chicago, appointed last month to study the question.

The critical transportation and supply position which would result from interruption of traffic in the winter makes such a program vital and, since the work will benefit the public of the area generally and industries other than oil, the cost of the project should be borne by the Government, the committee said.

The study developed that approximately 1,200,000 tons of freight per month will move on the Illinois Waterway this winter, 407,200 tons of which will be oil. All but 45,000 tons per month of the petroleum tonnage represents northbound movements. Probably more than 75 per cent of the movement is distillate and residual fuels.

The committee recommended that at least four river towboats equipped with ice-breaking equipment, together with the ice plows of the Coast Guard already available, should be assigned to the work. Three standard barges, also available, should be ballasted and used to furnish weight behind the ice plows. Also, two breaker barges should be built for towing by operators on the river. The whole operation should be directed by Inland Waterways Corp.

It was suggested that two of the ice-breaking towboats should be put into operation on December 15 for 75 days and two others on January 1 for 45 days. Last winter there were 18 days when ice completely halted navigation on the river and 20 to 25 days when channels were only partially clear.

Shell to Dedicate New Laboratory December 5

Shell Oil Co., Inc.'s new exploration and production research laboratory at Houston will be officially dedicated December 5, Dr. Harold Gershinowitz, director of Shell's exploration and production research division, has announced.

The new laboratory, one of the largest of its kind in the world, has been planned with a view to centralizing Shell's rapidly expanding research program. The laboratory will operate on the theory that problems involved in the quest for new and improved methods of oil exploration and production are so closely related that research in one field cannot proceed independently of the other. Consequently, the research division is divided into three departments—chemical, physical, and geological—all coordinated and cooperating.

Speakers at the ceremonies will be Col. E. O. Thompson, chairman, Railroad Commission of Texas; H. S. M. Burns, president, Shell Oil Co., Inc., and Gershinowitz.

Hearings Open Monday on Synthetic Rubber Industry

WASHINGTON. — A House armed services subcommittee will open hearings December 1 on the position of the domestic synthetic rubber industry in national security, to lay the basis for legislation to be enacted next year defining a national rubber policy.

Representatives of Government agencies dealing with rubber, the armed forces, rubber producers and the rubber consuming industries will be heard by the subcommittee.

Anniversary Event Planned

The West Virginia Geological Survey will celebrate its fiftieth anniversary December 5 in a joint meeting with the Appalachian Geological Society of Charleston, W. Va., and the Oil and Gas section of the Engineers Society of Western Pennsylvania, Pittsburgh.

L. F. McCOLLUM DAN J. MORAN JOHN W. BRICE

McCollum Succeeds Moran as Head Of Continental; Brice Steps Up

DAN J. MORAN, colorful veteran oilman, has resigned as president of Continental Oil Co. for reasons of health. He will be succeeded, effective December 1, by Leonard F. McCollum, formerly coordinator of producing activities of Standard Oil Co. (N.J.). McCollum's post has been filled by his former assistant, John W. Brice.

Moran was born in Cygnet, Ohio, in 1888, and grew up in the oil business, being the son of Mart Moran, a pioneer in the pipe-line industry. Dan Moran worked for Buckeye Pipe Line Co. in 1905 while still in school, received his B.S. degree from the University of Dayton in 1907, and did graduate work at the Case School of Applied Science. He then joined The Texas Co. and worked for several years in the oil fields and in constructing bulk plants along the Atlantic Coast and a refinery at Port Arthur, Tex.

In 1921 Moran was made vice president and general manager of The Texas Co. of Mexico where, among other achievements, he solved the problem of loading tankers in shallow water by building the world's first flexible submarine pipe line and also pioneered in the use of airplanes in oil operations. After 2 years he was called back to the United States to become general manager of The Texas Co.'s producing department, and subsequently was elected vice president, director, and member of the executive committee.

In 1928 Moran became president of Marland Oil Co. which he reorganized and combined with Continental Oil Co. (Maine) the following year. He concentrated on building up Continental's crude-oil reserves, increasing the company's annual production from approximately 13,000,000 bbl. in 1928 to an estimated 37,000,000 bbl. in 1947.

McCollum was born in 1902 in Bradford, Tenn., and received his early education in the public schools of Fordtran and Cuero, Tex. He majored in geology at the University of Texas and received a B.A. degree in 1925, following which he joined Humble Oil & Refining Co., an affiliate of Standard Oil Co. (N.J.), and in 1926 was named division geologist at San Antonio. In 1934 he was transferred to Carter Oil Co., another affiliate of Standard, as chief geologist and manager of exploration, and became vice president in 1938 and president in 1941 on the retirement of J. J. Conry.

The parent company took McCollum to New York in 1943 to become assistant coordinator of producing activities for the entire Standard organization, and a year later he was made coordinator.

Brice has been engaged in exploration and producing activities of Standard affiliates for 20 years. Born in Miami, Tex., in 1903, he received a B.A. degree in geology from the University of Texas in 1927 and the same year joined Humble as a geologist. Later Brice served with Jersey affiliates in Venezuela before moving to Carter, where he became executive vice president and a director. In 1945 Brice was transferred to New York to serve under McCollum as assistant coordinator of producing activities for Standard Oil Co. (N.J.).

M. W. Hall, assistant general manager of Creole Petroleum Corp., has been elected a director of Creole to succeed McCollum. Hall has been associated with Standard Oil Co. (N.J.) and its affiliates since 1921. He has been assistant general manager of Creole since August 1946.

Barton Will Address Texas A. I. M. E. Meeting

T. H. Barton, chairman of the board of Lion Oil Co., El Dorado, Ark., will be principal speaker at the all-Texas meeting of the Petroleum Division of the American Institute of Mining and Metallurgical Engineers, to be held in College Station, Tex., December 4-5.

Barton will speak at the Thursday night banquet.

Papers to be presented on the opening day include: "Research Facilities at A. & M. College of Texas," H. W. Barlow, dean of the school of engineering, Texas A. & M.; "Progress in Petroleum Production Research," Dr. C. R. Hocott, Humble Oil & Refining Co., Houston; "Optimum Conditions for Condensate Recovery, Burton W. Whiteley, Standard Oil Co. (Ohio), Oklahoma City: "Corrosion Insurance Through Plastic Insulation of Pipe Fittings," J. A. Clay, Sr., Service Engineers, Inc., Fort Worth; "Diamond Coring and Core Analysis of Fractured Dolomite in the Permian Basin," Burton Atkinson and David Johnson, Humble Oil & Refining Co., Midland, Tex.; "Cased vs. Open Hole Completions in the West Texas and New Mexico Area," R. M. Rutledge and W. J. Jackson, Lane Wells Co., Dallas; "The Possible Future of the Petroleum Division," William H. Strang, executive secretary of the petroleum division of the A.I.M.E.; and "Acidization of Producing Formations," T. J. Tighe, student, A. & M. College of Texas.

Papers to be presented on the second day include: "The Function of Petroleum Engineering Departments and Their Relation to Management," D. V. Carter, Magnolia Petroleum Co., Dallas; "Energy Relations in the Flow of Gas Through Sands," W. H. Bowie, University of Texas; "Drilling Mud Control in Southwest Texas," M. E. Mitchell, Kingsville, Tex.; "Water Flooding in Texas," R. K. Guthrie and J. W. Amyx, U. S. Bureau of Mines; "Natural Gas Reserves of the State of Texas," Jack Crichton, DeGolyer & McNaughton; "Some Capillary Pressure Connate Water Saturation and Relative Permeability Relations," Dr. George H. Fancher and Leroy Puls, University of Texas; and "Vertical Segregation of Zones with Plastics in Oil and Gas Wells," C. E. Mangold, Dowell, Inc.

Crude Exports, Imports Show September Gain

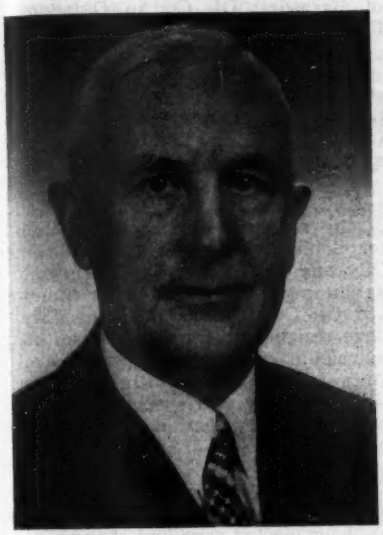
BOTH exports and imports of crude oil showed increases during September as compared with the previous month, according to statistics compiled by the Bureau of the Census.

Exports of motor fuel and gasoline showed a slight drop, while imports of gas and fuel oil showed an increase of 11,442 bbl. daily.

Comparisons between imports and exports for September, August, 1947, and September 1946 may be found in the following table. Figures represent the daily average, in barrels:

	Sept. 1947	Aug. 1947	Sept. 1946
Exports:			
Crude petroleum	136,233	133,516	122,900
Gas and fuel oil	127,000	122,581	90,733
Motor fuel and gasoline	83,367	87,710	109,167
Total	346,600	343,807	322,800
Imports:			
Crude petroleum	286,367	255,452	271,800
Gas and fuel oil	135,700	124,258	171,200
Total	422,067	379,710	443,000

PERSONALS



Trans-Arabian Head Has Varied Experience

H. H. HALL, a native Chicagoan and a 1904 graduate of Stanford University in civil engineering, is a widely known engineer in the petroleum industry. He recently was named a director and vice president of Trans-Arabian Pipe Line Co. and is devoting his time to the planning and construction of the projected 1,050-mile Arabian pipe line.

Hall, who was assigned as consultant in the construction of the Ras Tanura refinery in Saudi Arabia, was first employed with Standard of California as a member of the pipe-line department, working in the San Joaquin Valley on location work for new lines and pump stations. The following year he returned to Stanford as instructor in civil engineering where he remained for 2 years.

For the next 3 years he was engineer in charge and superintendent of ditch-flume construction for Yukon Gold Co. in Alaska. It was during this time that Hall became an enthusiast for big-game hunting.

In the pipe-line department of Standard of California, Hall served as principal assistant engineer and as chief engineer and as assistant superintendent in direct charge of oil-reservoir construction. It was in 1921 that he was made chief engineer for Standard and in 1929 was given the added title of chairman, board of engineers. In 1937 he was made chairman of the company's technical employment committee, to arrange for and coordinate employment of technical graduates of colleges and universities.

John A. Legge, Jr., in charge of geophysical operations for United Geophysical Co. in Naval Petroleum Reserve No. 4 in Arctic Alaska, visited points in the Southwest last week en route to Los Angeles from Washington, D. C., where he attended sessions of the committee in charge of the exploration operations under way in the reserve. He will return to Alaska about January 1 from the California offices of his company. Legge described Arctic oil operators to the Tulsa Nomads at a luncheon meeting, November 19.

W. W. McDonald, South Texas district geologist for Arkansas Fuel Oil Co., has resigned to accept a position as geologist with Taylor Refining Co. in San Antonio.

John M. Campbell, formerly with E. I. Du Pont de Nemours & Co., Inc., in Cleveland, Ohio, and Hanford, Wash., and now instructing in the School of Chemical Engineering at the University of Oklahoma, where he is working toward his master's degree in chemical engineering, has been appointed to the Gulf Oil Corp. fellowship at the University. Campbell graduated from Iowa State University in 1943.

Eldon Young, formerly in charge of Gulf Oil Corp.'s law department office in New York, and **Archie D. Gray,** formerly assistant attorney general for Texas, have been appointed general attorney and associate general attorney, respectively, for Gulf Oil Corp. with headquarters in Houston.

Douglas Orme has been elected vice president of Cosden Petroleum Corp. in charge of traffic. Orme joined the traffic department of Cosden in 1929. Since 1935 he has served the company as traffic manager.

J. Parks Gwaltney, president of Gwaltney Oil Corp., Durham, N. C., and president of the North Carolina Oil Jobbers Association, has been named chairman of the National Council of Independent Petroleum Associations. Gwaltney succeeds **Gordon Duke,** chairman of the board, Southeastern Oil, Inc., who declined reelection because of pressing company duties.

H. E. Bramston-Cook, general sales manager for Oronite Chemical Co. of San Francisco, a subsidiary of Standard Oil Co. of California, has been appointed to the newly created position of general manager of eastern operations, with headquarters in New York.

Dr. Robert L. Smith, engaged in process development for Sinclair Refining Co., has been appointed supervisor of the project evaluation division of Sinclair's research and development department at East Chicago. His new assignment, which involves planning of research programs, project evaluation, data correlation, and development of design methods, was made in conjunction with the scheduled expansion of research activities to be carried out at the company's new laboratories in Harvey, Ill. **Harry Mayland** has been appointed assistant to Smith.

Charles J. Conkling, who has been doing special work at the University of Oklahoma, has returned to Midland, Tex., where he has joined his father, **Russell C. Conkling,** an independent oil operator and consulting geologist.

George C. Fraser, recent graduate in geology from Princeton University, has joined the Midland office of Sun Oil Co. as geological scout for West Texas and New Mexico areas.

H. W. R. Wardlaw is visiting several of the Shell operations in the southwest. He recently completed a tour of duty as an equipment engineer for the Anglo-Egyptian Oilfields, Ltd. (Shell) in Egypt. He joined the Shell organization in 1939 and has been employed by Shell operating units in Trinidad and Romania. After he completes his study of developments in the United States, he will return to The Hague and later become associated with the Shell operations in British Borneo as an equipment engineer and logging specialist.

George H. Pappas, Houston geologist, has joined **W. E. Brubeck** to form a consulting firm at Mt. Carmel, Ill.

John C. May, district geologist for Tide Water Associated Oil Co. in Bakersfield, Calif., has resigned to enter consulting work.

PERSONALS

Bill Hall, graduate of Hardin-Simmons University in petroleum engineering, has joined The Texas Co. as petroleum engineer in Colombia.

R. C. JOHNSON

Ray C. Johnson, formerly secretary-treasurer and a member of the board of directors of Shamrock Oil & Gas Corp., Amarillo, Tex., has been elected vice president and general counsel of the company, effective December 1. He has been closely connected with the company since 1929 when he acted as attorney in its organization. **F. V. Wallace** and **B. E. Tyler, Jr.,** have been elected secretary and treasurer, respectively, of the company. Wallace has been with the company since 1934. Tyler joined Shamrock in 1937 as office manager and in 1941 was elected assistant secretary and assistant treasurer of the company.

Alfred W. Sitarski, of the safety inspection department of Standard Oil Co. of New Jersey's Bayway refinery, has been promoted to assistant regional engineer in the mechanical department. In the company's Bayonne refinery three men were promoted to foreman positions in the pipefitting department. They are **James W. D. Gellatly, David F. Hagan,** and **Karl Plahta.**

Dr. Newcomb K. Chaney, formerly director of research for United Gas Improvement Co., Philadelphia, has been appointed director of the gas production research program of the American Gas Association. Chaney succeeds **Edwin L. Hall** who has been appointed director of the association's testing laboratories at Cleveland and Los Angeles. Chaney, a Rhodes scholar at Oxford University from 1907 to 1910, received his Ph.D. degree at the University of Pennsylvania in 1911.

Earl A. Nichols, formerly Mid-Continent division manager for Core Laboratories, Inc., at Dallas, has opened an office there as a petroleum engineering consultant.

H. D. Collier, chairman of the board of Standard Oil Co. of California, is the new president of the 25-Year Club of the petroleum industry, succeeding **Dan J. Moran,** who recently resigned as president of Continental Oil Co. Other new officers include: **Marion J. Greenwood,** Utah Oil Refining Co., governor for the Far West; and **Bryan S. Reid,** Socony-Vacuum Oil Co., Inc., governor for the North Central area. The club, which meets annually at the time of the annual meeting of the American Petroleum Institute, is composed of members of the petroleum industry who have had more than 25 years of service.

Kenneth Brill, district land superintendent for Continental Oil Co. at Ponca City, Okla., has been promoted to superintendent of the Rocky Mountain division with headquarters at Ponca City. He succeeds **H. P. McCauley** who is resigning December 1.

James Tanham, vice president of The Texas Co., recently left for Havana, Cuba, where he is representing the International Organization of Industrial Employers at the United Nations' conference on trade and employment.

K. G. Shepard, district superintendent for Mabee Petroleum Co., which recently took over the properties of Mabee Oil & Gas Co., has been placed in charge of the recently opened district office at Grayville, Ill.

Martin Matson, South Texas district geologist for Cities Service Oil Co. in San Antonio, is being transferred to Houston as district geologist.

Reginald D. Dawson, senior chemist in the production department of Shell Oil Co., Inc., has been promoted to senior exploratory engineer in the Los Angeles laboratory. Other promotions in the production department include **Harold B. Lemaire,** surveyor and tank strapper to pipe-line engineer in the Los Angeles office; and **Wallace C. Thompson,** driller, to drilling foreman at Ventura, Calif. In the manufacturing department at the Wilmington refinery, **John C. Harrell** and **Russell E. Haverstock,** chemical operators, have been promoted to head operators. In Shell Development Co., **Edwin J. Fisch,** junior engineer, has been transferred from Wilmington to San Francisco, and **George K. Nelson,** chemist at Emeryville, has been transferred and promoted to chemical engineer at New York. **R. H. Bunzl,** junior technologist with Shell Chemical Corp., has been promoted to technologist at Shell Point.

J. M. Cunningham, assistant to the commissioner of conservation for Louisiana, **Joseph L. McHugh,** has received a special Chinese award from President Chiang Chung-Cheng for his outstanding service against the Japanese in the Luchow-Kwelein sector during World War II. Cunningham formerly was state geologist for Louisiana.

Garrett L. Bolyard, formerly of Tulsa, has joined the geological staff of Barnsdall Oil Co. in Oklahoma City.

Bob Dyktor has been placed in charge of engineering and construction for the marketing department of Creole Petroleum Corp. with headquarters in Caracas.

P. T. Amstutz, Jr., formerly head of the reservoir engineering section for Sohio Petroleum Co., Oklahoma City, and **G. L. Yates,** head of the valuation engineering section for Standard Oil Co. (Ohio), Oklahoma City, have resigned to form the consulting petroleum engineering firm of Amstutz & Yates, Inc., with offices in Wichita. They will specialize in reservoir and valuation engineering work.

Walter J. Osterhoudt, geophysicist for Gulf Research & Development Co., has been elected president of the newly formed Houston chapter of the Society of Exploration Geophysicists. Other officers elected include: **Dr. W. D. Mounce,** Humble Oil & Refining Co., first vice president; **Roy L. Lay,** The Texas Co., second vice president; **C. C. Zimmerman,** Keystone Exploration Co., secretary; and **Ed S. Sherar,** Tide Water Associated Oil Co., treasurer.

H. A. Weatherby, of Standolind Oil Purchasing Co., has been named manager of scouting. Other changes in company personnel include: **J. T. Perkins,** scout in North Texas field, promoted to chief scout; **J. C. Mytinger, Jr.,** and **H. H. Kauerz,** named assistant chief scouts; and **J. W. Shoemaker,** appointed representative at Tyler for East Texas fields.

Congratulating each other on another success are Louis E. Hanson, left, Socony-Vacuum Oil Co., Inc., New York, who was reelected chairman of the accounting committee of the American Petroleum Institute, and William L. Naylor, Gulf Oil Corp., Pittsburgh, who was reelected secretary

V. H. Miller, former Oklahoma City independent oil operator, is now operating out of Carmi, Ill.

DR. WRATHER

Dr. William Embry Wrather, director of United States Geological Survey, was elected president of the American Institute of Mining and Metallurgical Engineers last week at the meeting of the board of directors in New York. Wrather has served as petroleum geologist for Gulf Production Co.; as consulting petroleum geologist in Texas and Oklahoma; as associate chief of the Metal and Mineral Division of the U. S. Geological Survey; and since 1943, as director of the U. S. Geological Survey. **Cresap P. Watson,** vice president of Seaboard Oil Co., Los Angeles, was one of the five new directors elected, and **Irwin W. Alcorn,** Pure Oil Co., Houston, was named chairman of the institute's petroleum division.

R. B. Saxe, Gulf Oil Corp., Odessa, Tex., was elected chairman of the Permian Basin Chapter of the American Petroleum Institute at its annual meeting, November 22. Other officers named were: **Frank R. Lovering,** Shell Oil Co., Inc., first vice chairman; **J. N. Dunlavey,** Skelly Oil Co., second vice chairman; **A. S. Donnelly,** Honolulu Oil Co., third vice chairman; and **Jay Boxell,** Phillips Petroleum Co., secretary-treasurer.

W. D. Lowry, formerly with the Oregon State Department of Mines and Geology, has joined The Texas Co.'s geological department in Taft, Calif.

Less Burrus, scout for The Texas Co.'s Seminole area at Shawnee, Okla., has been appointed chief scout for the Oklahoma division at Tulsa. Burrus succeeds **B. M. Smith,** who has been transferred to Casper, Wyo., as district landman. **Paul Duffield** will take the place of Burrus at Shawnee. **M. E. Ayers,** The Texas Co.'s Oklahoma-Kansas scout, has been transferred to Casper as division scout.

SHIFTS—

R. E. McClintock, superintendent, Rocky Mountain Drilling Co., Coalinga to East Bakersfield, Calif.; **Bowman Waters,** superintendent, Claude Bell Oil Co., Centerville to Gainesville, Tex.; **John C. Major,** engineer, Atlantic Refining Co., Grand Prairie, Tex., to Ft. Collins, Colo.; **V. V. Thomasson,** superintendent, Barnsdall Oil Co., Victoria, Tex., to Marlow, Okla.

Elliott H. Powers, geologist, Gulf Oil Corp., Fort Worth to Midland, Tex.; **David A. Kinney,** foreman, Stanolind Oil & Gas Co., Greggton, Tex., to Mannford, Okla.; **Roy T. Durst,** engineer, Rowan Drilling Co., Midland to Houston, Tex.; **R. H. Tennant,** geologist, Shell Oil Co., Inc., Midland, Tex., to Carlsbad, N. M.; **A. G. Eberts,** foreman, The Texas Co., Tyler to Beaumont, Tex.; **Charles N. Hefner,** engineer, Mud Control Laboratories, Wichita Falls, Tex., to Vernal, Utah.

James W. Agnew, engineer, Gulf Oil Corp., Wickett to Goldsmith, Tex.; **O. I. Jants,** foreman, Amerada Petroleum Co., Crowley, La., to Hattiesburg, Miss.; **T. J. O'Halloran,** engineer, The Texas Co., Gretna to Harvey, La.; **Lee Naylor,** superintendent, Helmerich & Payne, Inc., DeRidder, La., to Brookhaven, Miss.; **J. L. Keg Oliver,** superintendent, Bigwest Drilling Co., Homer to Jennings, La.; **Frederick Larsen,** engineer, The California Co., Waterproof, La., to Rangely, Colo.

O. L. Martin, foreman, The Texas Co., Newton to McLeansboro, Ill.; **Wade Moriarty,** foreman, Magnolia Petroleum Co., Norris City to Salem, Ill.; **W. A. Linker,** foreman, Danciger Oil & Refining Co., Brookhaven to Laurel, Miss.; **Charlie Love,** superintendent, Spartan Drilling Co., Brookhaven, Miss., to Golden Meadow, La.; **J. L. Wallace,** geologist, Apache Exploration Co., Brookhaven to Natchez, Miss.; **Robert L. McCormick,** engineer, Standard Oil Co. of Ohio, Cleveland, Ohio, to Oklahoma City.

O. P. White, superintendent, Phillips Petroleum Co., Duquoin to Paola, Kans.; **J. O. Motsenbocker,** engineer, Phillips Petroleum Co., Kansas City, Kans., to Bartlesville, Okla.; **Allard C. Hoxie,** geologist, Carter Oil Co., Rawlins, Wyo., to Denver, Colo.; **C. T. Rankin,** geologist, Amerada Petroleum Corp., Tulsa, to Rock Springs, Wyo.; **R. M. Brackbill,** engineer, Shell Oil Co., Inc., Chelsea to Oklahoma City; **Frank Gray,** superintendent, Anderson-Prichard Oil Corp., Yukon, Okla., to Manzanola, Colo.; **J. M. Boxell,** foreman, Phillips Petroleum Co. Edmond to Guthrie, Okla.

R. S. Jackson, engineer, Independent Exploration Co., Houston to Beeville, Tex.; **Ed D. Parsons,** engineer, Humble Oil & Refining Co., Houston to Bartlesville, Okla.; **William F. Shelton,** engineer, Humble Oil & Refining Co., Houston to New Orleans; **Joseph W. Tribble,** foreman, Stanolind Oil & Gas Co., Pampa to Longview, Tex.

DEATHS

Lewis Ruffner Smith, Jr., recently retired chief resident engineer for Tide Water Associated Oil Co. at Los Angeles, died recently in Bakersfield, Calif. Smith had been with Tide Water since 1918 and was particularly active in oil field safety engineering.

Thomas E. Patrick, 37, general manager of Kuwait Oil Co., Ltd., died November 24 at Johns Hopkins Hospital, New York, following a brain tumor operation. Patrick, a native of Hamilton, Tex., has been with Kuwait Oil since 1937. Prior to that he worked for Gulf Oil Corp., which owns 50 per cent of Kuwait Oil, in Houston.

Roger Norton Williams, 55, construction engineer for Linde Air Products Co., a unit of the Union Carbide & Carbon Corp., died November 21 in Pittsburgh.

William C. Noller, who organized Noller Oil Co., Topeka, Kans., died recently near Oberlin, Kans.

Max A. Berns, publicity manager of Universal Atlas Cement Co., subsidiary of United States Steel Corp., died recently at his home in New Rochelle, N. Y.

David H. Wells, 56, staff engineer for Sinclair Refining Co., died November 20 in New York. Before joining Sinclair in 1932 he was an engineer for Socony-Vacuum Oil Co.

Julian Perry Hunnicutt, Houston independent oil operator for the past 15 years and formerly with Gulf Oil Corp., died November 19 in Houston.

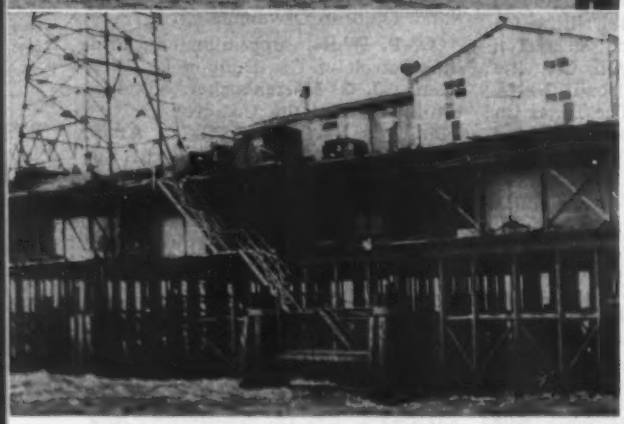
William B. Yowell, 67, retired plant superintendent for Standard Oil Co. of New Jersey, died November 17 in Washington.

Harlie F. Shafer, purchasing agent for Jarecki Manufacturing Co. for the past 49 years, died November 14 in Erie, Pa.

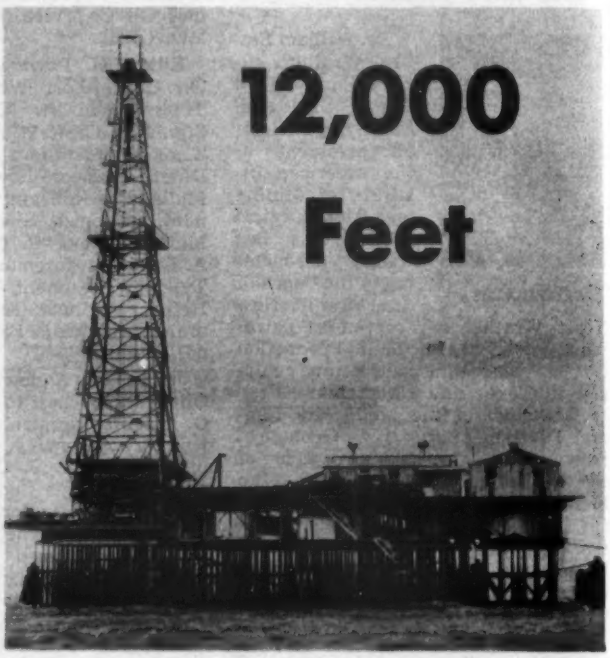
John M. Rebold, 73, former driller in the Clintonville district, Pennsylvania, died November 11 in Oil City, Pa.

Harwood Stacy, 65, former Wichita Falls, Tex., lawyer and oil operator, died recently in Wichita Falls.

DISTANT OFFSHORE WELL NEARS TEST DEPTH OF 12,000 Feet



Top: End view of platform. Office, lounge, and bunkhouse are located in building. Tanks on main deck (left) are fresh water tanks. Tank at right is reserve mud tank. Distance from ordinary high water level to upper deck is 32 ft. 9 in. Bridge (not completed at time of picture) is for landing crew during rough weather. Rope ladder will be fastened to short section of rigid ladder. Above: Side view showing stairs from water to the main and upper decks of platform. Boats are moored at this point to discharge passenger when sea is calm. At left on main deck are fuel and mud circulating tanks



Superior Oil Co. 1-A Gulf of Mexico now nearing test depth of 12,000 ft. Well is located off the Louisiana Coast in Vermilion Parish, Block 71, and is 18 miles from the nearest land

by Ed Short

SUPERIOR OIL CO. A-1 Gulf of Mexico, located in Block 71, 19 miles out in the Gulf of Mexico off the Vermilion Parish, Louisiana, shore, recently reached a depth of 10,163 ft. With the setting of 9⅝-in. casing at this point, the well will be drilled to a total depth of approximately 12,000 ft.

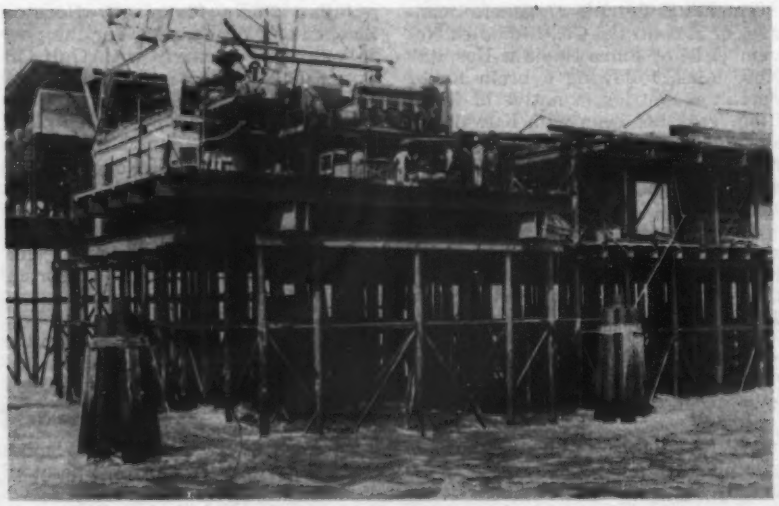
First phase of this offshore drilling project, which is perhaps the most interesting one now under way in the gulf, from an engineering standpoint, was described in the August 9 issue of The Oil and Gas Journal.

The second phase, involving the project fully rigged up, is described in this article. Recently pounded by waves which reached a height of 18 ft., this platform has successfully withstood the violent backlash of two tropical hurricanes which moved inland on the Louisiana coast east of the Superior location during the past summer.

With only a few exceptions, the drilling equipment on this project is practically the same as that ordinarily used on land or inland water locations. Power for the Superior rig is furnished by four 840-hp. diesel engines. A standby draw works is equipped with a separate engine of the same horsepower.

The derrick is 136 ft. in height and has a 30-ft. base. It is designed to withstand without guying, a 150-m.p.h. wind. Four and a half inch drill pipe 40 ft. in length is being used to drill the well. Surface pipe consists of 13⅜-in. set at 2,500 ft.

A specially designed Schlumberger

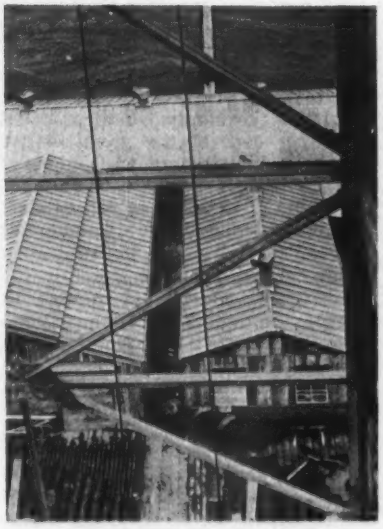


Closeup of derrick end of platform. Engine in foreground on platform near derrick floor is an 840-hp. diesel which drives standby draw works. Ideal Type 125 consolidated rig is powered by six Superior PTD-6 diesel engines. Engines are located in area of left background in picture

Above and left: Jack Taylor (inset), Superior tool pusher hoists passengers from Superior 63-ft. boat to platform during rough weather Right: Looking down from near top of derrick onto buildings and pipe rack. Foreground left is mud house, right is kitchen and dining room. Bunkhouse, office, and lounge in background. These Parkersburg prefabricated houses were designed to withstand 150-m.p.h. wind

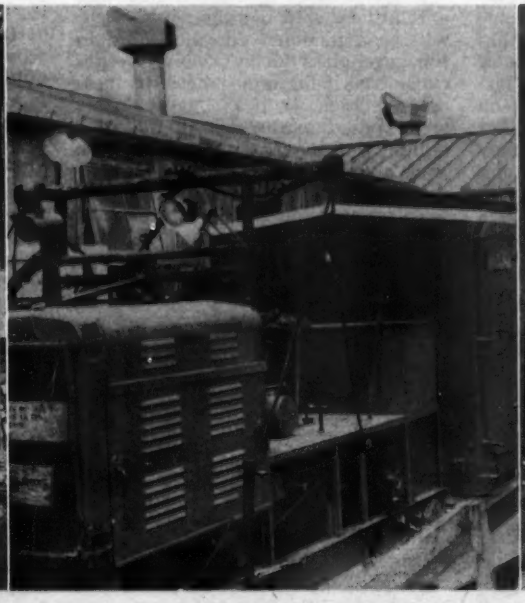
unit for offshore locations is being used for the first time on this project. It consists of a winch-and-cable unit powered with a diesel engine and a recording unit. The recording unit consists of a marine-type weatherproof cab in which is located an automatic recorder.

This unit is equipped to render the same service available on land jobs. When these services are needed it is necessary only for the operator to transport personnel and small auxiliary equipment such as side-wall coring guns, perforating guns, directional surveying instruments out to the location.

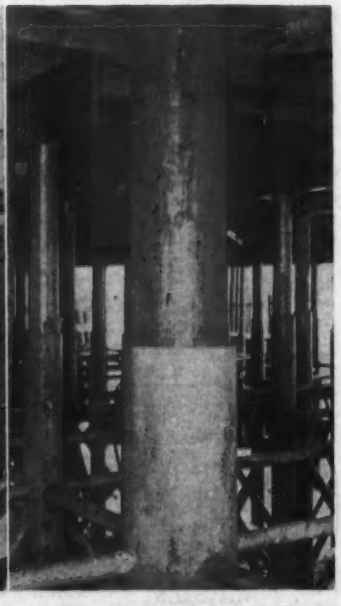


VIEWS OF AUXILIARY EQUIPMENT

Closeup showing method of keying pile to 10¾-in. jackets. Pile is 8¾-in. 28.55-lb. A.P.I. line pipe. Pile extends out of jackets for a distance of 4 ft.



Schlumberger unit specially designed for use in offshore locations. House is sealed against outside atmosphere as a protection to instruments. This equipment is readily portable as one unit



This cut shows surface pipe extending down through conductor built in templates. There are two other such conductors for drilling additional wells

Gaging Methods and Devices For Pressure Storage

by E. O. Mattocks

ONE of the simplest methods of determining the volume of product in a container is to weigh the loaded container. This weight, minus the tare weight of the container, equals that of the contained product. From the specific gravity or density of the material and its actual temperature in storage, it is possible to calculate the liquid volume in the container.

In the case of pressure vessels, the weight of the empty container is 25 to 50 per cent of the gross weight of container and contents. Obviously, this method is limited to portable containers of such size as can be conveniently handled on commercial scales. . . .

Gage glasses form a common method of gaging the liquid volume in pressure containers. A columnar gage glass is connected into the container at two different liquid levels. In large containers a number of gage glasses are provided, from the bottom to the top. Length of the one glass is usually limited for safety reasons. Possibility of breakage and other inherent disadvantages are balanced against the increased costs of making additional connections into the tank. To indicate the liquid level at all places in the tanks, it is necessary to overlap the gage glasses.

Several precautions must be observed when installing this type of gaging device. Gage glasses are fastened generally into connections on the tank by the use of slip fittings which are tightened when the glass is in place. These top and bottom tank connections tend to spread apart, and the friction of the slip joint and the stiffness of the tank connections must overcome the spreading action. If the unsupported length of the connection is very great, as is frequently the case when gage glasses are installed on the elliptical or hemispherical ends of horizontal cylindrical tanks or on spheres, spheroids, and the like, a considerable bending moment exists which aggravates the spreading action, and may cause leakage at the slip joints.

E. O. Mattocks is technical representative, chemical products department, of Phillips Petroleum Co., Bartlesville, Okla. He was graduated by Cornell University in 1926, and after spending 5 years engaging in the gas utility business, became industrial engineer for the American Gas Association Testing Laboratories, 1931-37. He joined Phillips in 1937 as an industrial gas engineer. Portion of paper presented at annual meeting of the A.P.I., Chicago, November 10-13.

If the product in the container has a relatively low boiling point, there will be a tendency for the liquid in the gage glass to boil. This is especially true if the atmospheric temperature is high, or if the gage glasses are exposed to direct sunlight. The boiling action of the liquid in the gage glass can result in a false indication of the liquid level in the tank.

To prevent the escape of tank contents in case a gage glass is broken, excess-flow valves should be installed in the tank connections, in such a manner that there is no possibility of breakage between the excess-flow valve and the tank. These valves consist frequently of a ball or slug which is forced against a seat if an appreciable flow through the connections takes place. It is necessary, of course, to install excess-flow valves on both top and bottom gage connections. Manually operated shutoff valves should also be provided at each tank connection.

Advantages of this method of gaging pressure tanks are: (1) It gives a direct indication of liquid level. (2) It is not necessary to permit the escape of contents to determine liquid level. (3) Any change in liquid level can be observed easily. Disadvantages of this method are: (1) The possibility of false liquid-level indication due to boiling of liquid in gage glass. (2) Gage glasses can be broken easily unless adequately protected. (3) The possibility of gage-glass tank connections being broken off. (4) Possibility of securing false liquid-level readings resulting from gage-glass valves being inadvertently closed.

Float Mechanisms

Use of a float on the surface of a liquid to indicate its position has been employed for a long time. By attaching a tape or line to the float, its position and movement can be observed outside the container. The line attached to the float can be carried out of the container to some desirable position for ease of reading. In the case of pressure containers, it is necessary that the line attached to the float be encased in a pipe capable of handling the same pressure as the container, in which case it will become a part of the container. In some cases, the pipe in which the cable passes has a liquid seal which permits the cable to extend into the atmosphere where it indicates the liquid height by movement up and down of a calibrated marker. . . .

In some cases, changes in specific gravity of the material in the tank are compensated for by an adjustment in the pointer position. By this means, changes in the float position caused by different gravity material can be corrected. . . .

Chief advantages of the float method are: (1) It is not necessary to vent any of the product outside the container to determine the liquid level. (2) It is relatively low in initial cost. (3) It is direct-reading. (4) It is easy to follow change of liquid level. Disadvantages are: (1) Inaccuracy is caused from change of float position in the liquid due to change in specific gravity of product. (2) Errors are caused by possible change in length of tape with change in temperatures. (3) Friction in pulleys supporting the tape may give erroneous readings. (4) In case of float-operating magnetic needle, gear mechanism

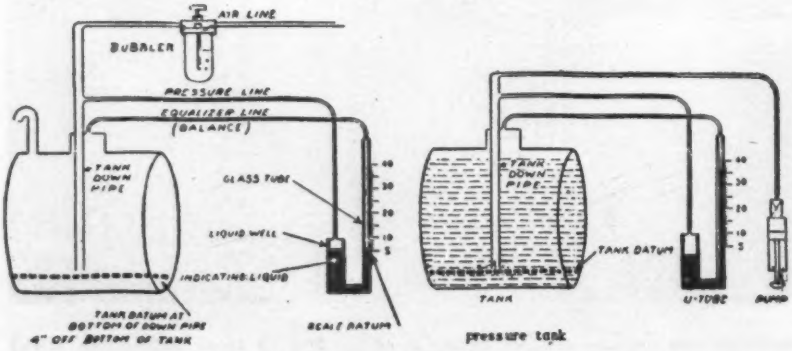


Fig. 1—Diagrams showing equipment application for the pressure differential method

may have sufficient friction to cause erroneous readings or cause erratic movement of the needle.

A very recent development adapts the float type of gage to an electronic instrument that utilizes a gamma-ray detector and the penetrating power of gamma rays emanating from a radium source in the float, to determine liquid level without any connections originating inside the container. The instrument containing the gamma-ray detector (Geiger-Mueller-type counter) is placed on the outside and at the top of the storage vessel; whereas the gamma-ray source, an iridium-platinum needle containing a minute quantity of a commercially available radium salt, is placed inside a suitable float, which is positioned directly below the detector. The detected gamma radiation is amplified, rectified, and converted to direct current, the magnitude of which is inversely proportional to the square of the distance between the source and the detector. Suitable electrical circuits further translate this direct-current value to a linear measurement of the height of the liquid level. By means of an electronic-recording controller, this device can be used to maintain a predetermined maximum liquid level or to produce a continuous record of the liquid level.

Change-of-State Devices

A number of devices are used to determine the liquid level by discharging the product stored through a small orifice and noting the point at which the discharged fluid changes from liquid to gas, or vice versa. By changing the position of the tube through which the product is permitted to enter, it is possible to determine the point where the end of the tube is exactly on the surface of the liquid.

When liquid is discharged through the orifice, it will appear generally as a dense fog. In the case of low-boiling materials, the discharged liquid through the orifice frequently will freeze the moisture in the air. When gas is discharged through the orifice, a less dense or practically invisible vapor escapes. The change of state from gas to liquid, or the reverse, usually is quite pronounced.

The oldest and the least exact method is the use of a number of small pet or "try" cocks or valves which are spaced some distance apart from the bottom to the top of the tank. By permitting fluid to discharge from these openings, it is possible to locate the approximate position of the liquid level.

A method employed extensively in the liquefied petroleum gas industry, especially in the measuring of liquid contents of tank cars, is the use of the slip tube. This consists of a tube which extends down into the container through a packing gland, which permits movement of the tube up and down without leakage of the product. On the upper end of the tube is installed a valve with a small orifice in the outlet. The valve is opened, and the tube is moved up and down until a position is found where a slight movement of the tube will show a change from liquid-to-gas or gas-to-liquid state. The tube is calibrated, and so marked that the liquid level (or outage) can be accurately determined and read directly.

To keep the length of the slip tube to a reasonable amount, only the upper part of the container (in the case of a tank car generally only the upper half) is gaged. An excess-flow valve is usually installed in the bottom end of the slip tube so as to prevent the escape of product if the tube should be broken off outside the container.

The slip tube is often used to indicate the maximum level to which a container is to be filled. In this case, the slip tube is moved to a point where the calibration of the tube indicates the maximum liquid level. The valve on the slip tube is then opened and vapor allowed to escape. The container is filled until liquid appears at the outlet of the slip tube, at which point the pump is shut off.

An adaptation of the slip tube used for horizontally mounted cylindrical tanks is the rotary gage. In this device the tube is bent in the form of an arc, and rotates about a point which is generally located in the vertical center of the container wall or end. In the case of vertically mounted tanks, a series of rotary gages may be used. The tube extends from the outside through a stuffing box to the inside, where it is bent in the form of an arc. The center line of the bent tube is indicated by a marker on the outside of the tank. Also on the outside is installed a valve with a small orifice similar to that used on the slip-tube gage. The tube is rotated until the surface of the liquid is located by noting the change from gas to liquid, or vice versa, escaping through the orifice. The pointer on the outside of the container indicates, on a calibrated dial, the position of the liquid surface. An excess-flow valve is frequently installed on the inlet side of the rotary gage to stop the flow of material through the gaging device in case the valve or tube on the outside is broken.

Frequently an indication of the maximum liquid level to which a container may be filled is required. The device used for this purpose is called a fixed-up tube. This is installed similar to the slip tube, except that the tube is permanently and rigidly fastened to the container or a fitting in the container. It is designed so that the end of the dip tube is located at the maximum level to which the container may be safely filled. A valve with a small orifice is used, similar to the slip tube and rotary gages.

In case the atmospheric temperature is near or below the boiling point of the liquid to be gaged, air or gas pressure can be applied to the vapor space in the tank, through a suitable vapor connection, to force gas or liquid into the gage tube.

Advantages of "the change of state" method are: (1) Relatively low initial cost. (2) Rugged construction. (3) Construction and operation are such that little can happen to render gage inoperative. Disadvantages are: (1) It is necessary to discharge some of contents to outside of tank. (2) Initial setting of gage must be made very accurately. (3) Changes in liquid level cannot be followed easily. (4) This type of gage cannot be adapted for indicating liquid level at remote locations. (5) Air or gas pressuring is required for gaging when vapor pressure is at or near 0 psi.

Pressure-Differential Methods

In this method, use is made of the pressure caused by the liquid head in the tank. Various devices are employed to measure this pressure.

In one device, a tube extends through the tank to the inside near the bottom. This tube is then connected to one side of a manometer. The other side of the manometer is then connected to the gas pressure on top of the container. To actuate the gage, air is introduced into the tube which extends down through the liquid to the bottom of the tank. Air pressure is applied until all liquid is removed from the tube. The manometer is then read, and indicates the pressure differential caused only by the liquid in the tank. From the specific gravity of the product in the container, at the temperature in the tank and the specific gravity of the liquid in the manometer, it is possible to calculate the height of liquid in the tank. The pressure-differential gage may be calibrated to read directly, in volume, for a product with a particular specific gravity.

This method has the following advantages: (1) Relatively low initial cost. (2) It is simple to operate. (3) The manometer may be placed at any location. Disadvantages are: (1) The specific gravity of the product must be known accurately. (2) The specific gravity of the manometer liquid must be known accurately. (3) Errors will exist unless great care is taken to be sure all the liquids are purged from the manometer line which extends to the bottom of the tank. (4) If air is used as the purging medium, the product may be contaminated. . . .

Anderson to Speak

H. H. Anderson, vice president and general manager of Shell Pipe Line Co., will be principal speaker at the December meeting of the East Texas chapter of the American Petroleum Institute, to be held in the Kilgore Hotel, Kilgore, December 3.

How the New "Saftyweld" Coupling Improves Pipe Line Repair

By W. R. Persons
The Lincoln Electric Company
Cleveland, Ohio

GREATER safety and reduced loss of operating time in welding joints in pipe lines that are in service are possible by use of the new "Saftyweld" coupling developed by The Standard Oil Company (Ohio). The coupling is being manufactured and is available to the industry. Patent has been applied for by The Standard Oil Co. (Ohio). This new method of making section replacements eliminates all forms of plugs and permits the pipe line to be put back into operation immediately and arc welded later.

Fig. 1. The "Saftyweld" Coupling.

The coupling (Fig. 1) consists of a steel sleeve with internal grooves near each end. Neoprene packing rings fit into these grooves. With special pressure guns, a stiff, putty-like lubricant is forced in and squeezes the packing rings between pipe and coupling walls to make a leak-proof seal. These seals have been tested to over 1,000 lbs. per sq. in. gasoline pressure without leaking.

Installing Coupling

Here is the installation procedure, illustrated by photos taken during a recent section replacement in a 6″ line. This 8-year-old line carries by-product refinery gas.

First the old section is cut out by mechanical method, and the new prefabricated section is moved into place. Burrs from cutting are filed off the pipe. The "Saftyweld" coupling is pushed onto one pipe end (Fig. 2), the pipe ends aligned and the coupling spaced equidistant on each. Coupling is accurately positioned by first chalk-marking the pipe.

Fig. 2. Installing the coupling. Vapor pack and bonding cable reduce hazard of vapors and static electricity.

The six cup-point set screws in each end of the coupling (Fig. 1) are then tightened. This centers the pipe inside the coupling and clamps it to withstand a pull of 30,000 to 45,000 pounds.

Fig. 3. Lubricant is inserted with guns at pressures up to 10,000 lbs. per sq. in.

Inserting Lubricant

Next step is to remove the ⅛″ pipe plugs and insert lubricant behind the packing rings (Fig. 3). Lubricant is forced into each hole until either the lubricant or the packing ring starts to bulge into an adjacent plug hole. The pressure gun is then removed and the plug started, but not tightened, into the hole. (When the gun is removed, the packing ring acts like a check valve and snaps shut against the hole, preventing escape of lubricant.) After lubricant has been inserted all around, the plugs are screwed in tightly.

Fig. 4. Running the stringer bead. Photos by John F. Trauger, The Standard Oil Co. (Ohio)

The coupling is then pressure tight and the line can be put back into operation immediately. If safety considerations dictate, welding can be delayed for several days or weeks.

Welding Procedure

The coupling is welded to the pipe with a stringer bead and two passes—on this 6″ pipe, all were made with 5/16″ "Fleetweld 5." After the stringers are run, the set screws are removed and the holes plug welded to seal the joint and give additional strength (Fig. 4). The finished welds are 7/16″ x 7/16″ fillets, which meet ASA requirements. Fig. 5 shows the completed job. The pipe plugs have been seal-welded, which is generally not necessary.

This "Saftyweld" coupling eliminates time-consuming fitting and the hazards of bevelling with a torch. It also eliminates all fires and sparks until the line is put back into operation and vapors have cleared away.

Fig. 5. The completed welded joint is as strong or stronger than the rest of the pipe line.

The above is published by LINCOLN ELECTRIC in the interests of progress. Bul. 418, "Building Better Pipe Lines," is available. Write The Lincoln Electric Company, Dept. 2012, Cleveland 1, Ohio.

Give the CONTROL VALVE a chance!

by Claude B. Nolte

THIS article will review the more important factors to be considered in the selection of control valves. This will not include a description of the method used to select the proper size valve itself, as that subject has been amply covered in other papers and various bulletins and catalogs, representatives of the control-valve manufacturers. Also, the various manufacturers have made extensive tests of their equipment and have prepared charts to be used in the actual valve-size selection using design flow rate and pressure drop.

Principal subject here will be the description of a system for determining the design pressure drop to be used in selecting the actual valve size. The importance of this factor is not always recognized because it is rather automatically cared for by the common custom of allowing the control valve a pressure drop of 10 or 15 psi. In the majority of installations, the friction in the pipe, heat exchangers, etc., does not amount to more than 20 or 25 psi.; in such a case, 10 or 15 psi. for the valve will provide a satisfactory degree of flexibility. When a person is faced with a selection for the unusual installation, it then becomes necessary to consider the factors that actually control the flexibility of valves. These factors are the probable variations in flow rate, the initial loading of the valve, and the percentage of the total design friction losses that are allotted to the control valve.

Reduced to simple terms, a control valve is merely a variable resistance placed in the system to maintain a specified flow rate against head losses, or to maintain a specified pressure differential with varying flow rates. The automatic control valve is not required in a system where variations in flow are unimportant.

Take a lawn sprinkler, for example; the flow rate is set by eye, but if that rate changes with varying water-main pressures, it makes little difference. That does not apply, for example, to the feed rate to a butane splitter. In this case, constant flow is of the utmost importance. There are other applications in a refinery, or gasoline plant, where flows must be controlled, but, within specified limits. That is to say, the system is designed for a certain throughput, but as a result of variations in gasoline content of the gas, or crude-stock composition, or other factors, the actual flow rates may be, from time to time, greater or smaller than the design rate. Prediction of the exact magnitude of these variations is frequently somewhat difficult but, fortunately, properly selected control valves have sufficient inherent flexibility so that the actual flow-rate variations need only be known approximately, rather than exactly.

Discussion with the process or plant engineer will usually reveal whether the probable variations in flow will result in rates greater than the design flow or smaller; and whether the change will be in the order of 10 per cent or 50 per cent.

Gasoline-Plant Example

Consider a simple example in a gasoline plant in which the rate of flow of hot lean oil from the stripper will not be subject to wide variations if the lean-oil flow rate to the absorber is fixed by means of a rate of flow controller. Therefore, the pressure drop absorbed by the control valve regulating the flow from the stripper through the heat exchangers to the lean-oil surge tank need only be a relatively small per cent of the friction in the heat exchangers and lines themselves. On the other hand, the back-pressure regulator on the stripper overhead accumulator must be designed to accommodate wide variations in flow rate and must absorb, by far, the majority of the friction in this system.

Heat-exchanger and line friction should be known with a reasonable degree of accuracy when the selection of a control valve is to be made. In most installations, the effect of line friction is far less important than heat-exchanger friction. The heat-exchanger manufacturer is usually able to furnish reliable pressure drop information for his equipment. Pipe-line friction at the design flow rate readily can be computed with sufficient accuracy by using one of the many simplified charts or formulas generally available. The charts in the Crane Co. monograph No. 409 are especially recommended for this purpose.

The problem of control-valve selection can be boiled down to the simple determination of how much pressure drop must be allotted to the control valve when the fixed friction at the design flow rate and the probable variation in this flow rate are known. If insufficient friction is allotted to the valve, small variations in flow rate may result in the valve being wide open or nearly closed (in either case resulting in loss of control) even though, at design conditions the valve would be riding at what is considered the normal position. If, on the other hand, too much friction is allotted to the valve, dollars are dumped down the drain in the form of wasted horsepower. Therefore, it is not only a matter of good plant operation but also one of sound economics to select valves properly.

The author, with Barton Instrument Co., Los Angeles, is a member of the Southern California Meter Association, Long Beach and Los Angeles, and this paper is presented here through special arrangements with the association.

Discussion on "Valve Loading"

A term used in designating automatic-control-valve performance is "valve loading." This term designates the ratio of the actual flow rate through the valve to the maximum capacity of the valve at some specific pressure drop. If, for example, a valve were capable of passing 100 g.p.m. at a pressure drop of 10 psi., the loading would be 0.6 when the

valve was actually passing 60 g.p.m. at the 10-psi. pressure drop.

Control valves are normally selected so that the loading at design conditions will be somewhere between 0.4 and 0.75 depending on factors such as process lag and whether probable variations in flow rate will be greater or less than design rate. Ideally, a valve should be able to control with a loading of from 1.0 down to about 0.05. Practically, however, this range is not commonly possible. The change in flow rate for a given percentage of valve-stem travel is not constant over the entire range of loading of the valve, at least not for the most practical plug styles. This means, in turn, that the valve's sensitivity will not be in balance with the controller sensitivity when the loading on the valve under normal flow conditions is much smaller than the loading on the valve for design flow rates.

It is well known that the over-all sensitivity of the controller and the valve must be in balance with the particular system that is being controlled. If there are extensive time lags in system, the balance between the system and the control mechanism can readily be upset by changes in over-all controller sensitivity.

By time lags is meant that a considerable interval of time will elapse between a change in flow rate made by a variation in position of the valve stem and the recognition of the results of this change by the controller. If, on the other hand, the system time lag is small, or where periodic flow variation produced by cycling, is not detrimental to the plant operation, the control valve will work satisfactorily with a loading all the way from 0.95 down to 0.10 or even less. In the critical parts of the plant, however, where cycling must be prevented, the upper limit of loading under abnormal flow ranges from 0.85 to 0.90 while the lower limit lies between 0.30 and 0.20 depending upon the length of the process lags. The greater the process lag the narrower will be the workable loading range.

Valve Loading

Let us look once again at this business of valve loading. It must be clearly understood if what follows is to make sense. Valve loading is the ratio of the actual flow to the maximum capacity at the pressure drop available for the actual flow conditions. If the pressure drop across the valve varies as the flow rate changes, then the maximum capacity used in figuring the valve loading, will also change. This point can so easily be overlooked. We may say, "Well, the valve has a maximum capacity of 100 g.p.m. at design pressure drop, the flow will be only 60 g.p.m.; therefore, we have 40 g.p.m. to spare." That is not necessarily so because the maximum capacity remains 100 g.p.m. only if the pressure drop does not change. In a practical system, of course, the pressure drop across the valve with varying flow rates must change to some degree. However, if the fixed friction in the system is relatively small compared to the valve friction, this variation in pressure drop across the valve will be small, and, we may say that for all practical purposes, the maximum capacity of the valve will remain constant. This, in turn, means that the change in valve loading as the flow rate varies will be virtually in proportion to the flow rate change.

As an example, if the pressure drop across the valve at a resign flow rate of 60 g.p.m. is 10 psi., and the line friction is ¼ lb., while the design valve loading is 0.6, a reduction in flow rate to one half would result in a decrease in valve loading to essentially 0.3 because the pressure drop across the valve would be increased by only ¼ lb., a negligible figure compared with the initial 10 psi. When the pressure drop across the valve remain constant, the maximum capacity of the valve is fixed, in this case 100 g.p.m., and therefore, valve loading is directly proportional to the change in flow rate. This ideal condition is, by no means, the general rule. In most cases fixed friction is equal to, or greater than, the valve friction at design flow rate. Under these circumstances, the variation in valve loading will be, by no means, proportional to change in flow rate.

10-Psi. Friction

In the system that was just described above, consider now that the pipe-line friction is 10 psi. instead of ¼ lb., but let all other factors remain the same. The valve maximum capacity is still 100 g.p.m. at the design pressure drop across the valve of 10 psi., and, since the design flow rate is 60 g.p.m., the initial loading on the valve is 0.6. If the flow rate decreases to 30 g.p.m., the pipe-line pressure drop will fall from the design condition of 10 psi. to a new value of 2½ psi. This occurs because the pressure drop in the pipe line is proportional to the square of the flow rate. Thus, if the flow rate is halved, the pressure drop is quartered. The total system friction, however, must remain at 20 psi. Now, what has happened to the valve's maximum capacity? Originally, it was 100 g.p.m. at the design pressure drop of 10 psi., but now the pressure drop has been increased by 7½ psi. because of the reduction in the pressure drop in the pipe line. The maximum capacity of the valve varies as the square root of the pressure drop across it; therefore, its maximum capacity will be increased by the square root of the ratio between 17.5 and 10, which is 1.35. The result is a new maximum of 135 g.p.m. in place of the original figure of 100 g.p.m. The actual flow rate is now 30 g.p.m., which makes the valve loading equal to 30 divided by 135, which is 0.23.

Now, observe what has happened. The flow rate was reduced from 60 to 30 g.p.m., but the valve loading has been reduced from 0.6 to 0.23. Ordinarily, this loading would give good control; only under certain circumstances involving large process lags might it place the valve on the threshold of cycling. Thus, we can see that when there is friction in the system, other than that absorber by the control valve, valve loading and change in flow rate are no longer proportional.

Increase in Flow Rate

What happens if the rate of flow is increased! Using the same setup, suppose the flow rate to be increased by 20 per cent from 60 to 72 g.p.m. The pipe friction increases from 10 to 14.4 psi., leaving only 5.6 psi. drop for the valve. The new maximum capacity will be 75 g.p.m. which results in a valve loading of 0.96. For all practical purposes this valve can be considered wide open. An increase in flow rate of only 20 per cent will raise the valve loading from 0.6 to 0.96 when the valve absorbs one-half the design pressure drop.

To further explain what happens as the percentage of pressure drop allotted to the valve is decreased, take the general example cited above, but this time assume that the pipe lines and a heat exchanger have a combined pressure drop of 40 psi. at the design flow rate. Once again, suppose the rate to be cut from the initial 60 to 30 g.p.m. The pressure drop in the heat exchanger and lines will fall from 40 to 10 psi., but now the valve will be called upon to absorb that extra 30 psi., increasing its pressure drop from the original figure of 10 psi. to a new figure of 40 psi. That will result in an increase in maximum capacity from 100 g.p.m. at design conditions to a new capacity of 200 g.p.m. The valve loading will now be 30 divided by 200 which equals 0.15. Such a loading will usually be too low for good control if the system has appreciable lag. Here we have an example of a case where the valve loading has decreased to one-fourth of the initial value when the flow rate was reduced to one-half.

Using the same example, let us consider what happens when the flow rate is increased. We will make this increase small, say only 10 per cent. The pressure drop in the heat exchanger and lines will be increased by the square of the change in flow rate, or to 48.4 psi. The total pressure drop in the system, it will be remembered, was only 50 psi. to begin with. This means that the pressure drop available for the valve has decreased from the design figure of

(Continued on page 78)

Special Midget Rig Prepares Locations at Rangely

by Neil Williams

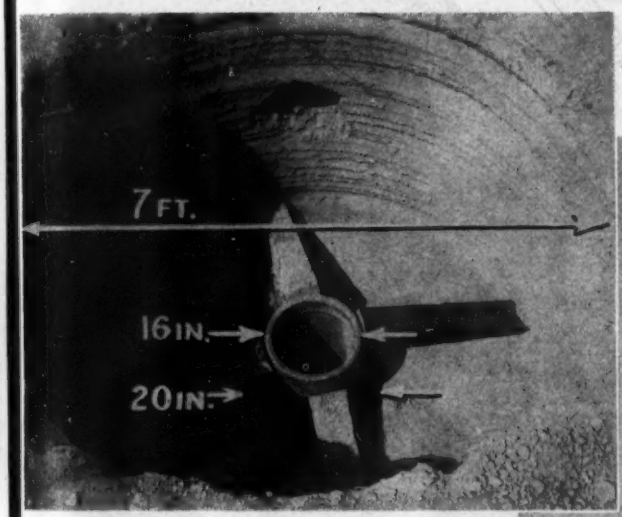
INSTEAD of starting wells with a large drilling rig as has been the general practice until recently, most operators in Rangely field of northwestern Colorado now are employing a light, truck-mounted "dry hole" drill. This unit, only lately introduced in the field, digs the cellar, the conductor hole, rat and mouse holes, and the four dead men holes for the derrick guy-line anchorage. By doing all this work, including the setting and cementing of the conductor pipe, in advance of moving on the big rig, appreciable economies are being realized, not only in the physical cost of the work itself but in the time saved the rig.

Previously, only the cellar and the four anchor holes for the derrick guy lines were prepared ahead of the drilling rig. These, as is usually necessary, were dug manually. Six men ordinarily were employed, and the job, including pouring of cement for walling and flooring the cellar, required a full day's time. Total cost for the cellar and four anchor holes for a well in this field has averaged $224.

From 35 to 45 ft. of conductor hole is drilled. Normally, this is 20 in. in diameter to accommodate 16-in. pipe. When drilled with the big rig, this is charged for at prevailing contract footage rate for the entire hole. This rate has been as high as $12 per foot, although it now is down to $8. Using the latter figure and an average depth of 40 ft., the cost of a conductor hole to the operator would be $320, exclusive of the pipe and cement. This would make a total cost for the cellar, conductor hole, and guy-line anchor holes of approximately $544.

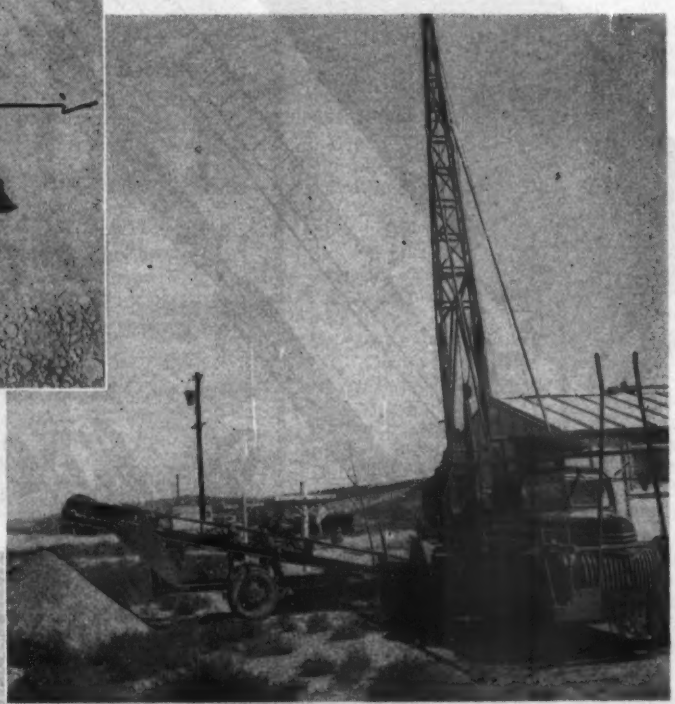
With the dry-hole drill, the cellar and conductor hole usually are dug as a single job. Contract rate at present is $5 per foot, which would make the cost of a 40-ft. conductor hole $200. Cellars dug with the unit are circular and are drilled and reamed to a maximum diameter of 7 ft. and a depth of 5 ft. Average cost of this is approximately $55,

(Continued on page 88)



Cellar and conductor hole dug with "dry-hole" drill, showing conductor pipe set and braced while waiting for cement to be poured. Diameter of cellar is 7 ft., conductor hole 20 in., and pipe 16 in.

Below: With mast truck-mounted "dry-hole" rig is ready for work. Endless-belt conveyor unit at back is towed as two-wheeled trailer



Left: Dry-hole digger starting conductor hole for well in Rangely townsite. "Bucket," full of cuttings and hoisted to surface, is being dumped into receiving box on endless belt conveyor unit

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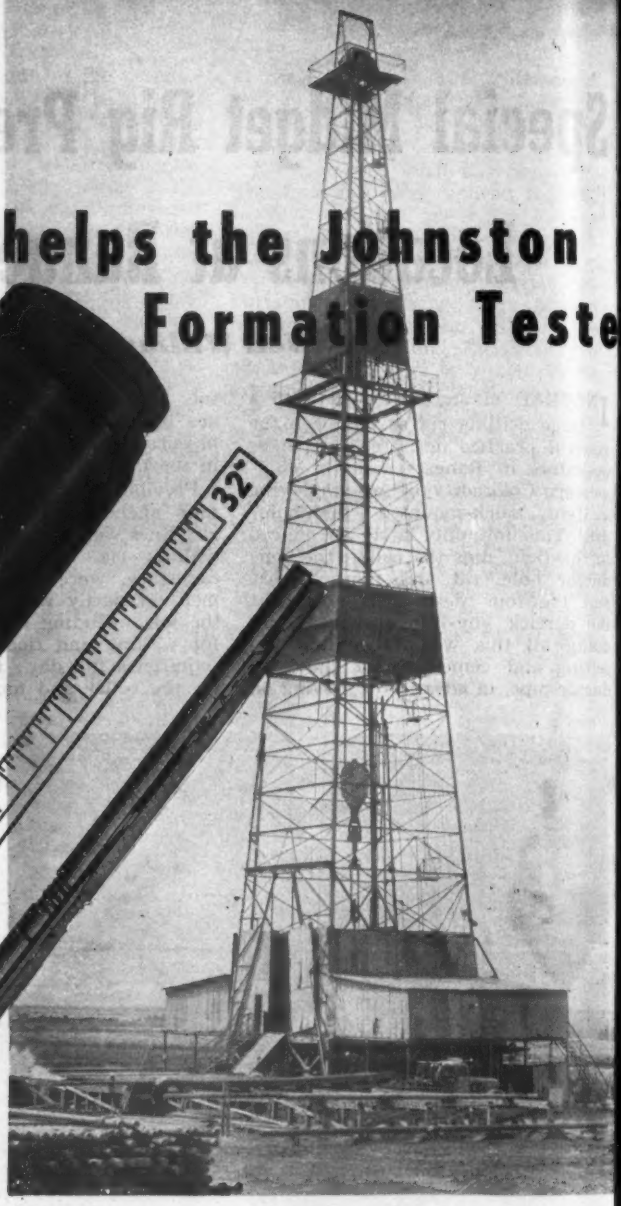

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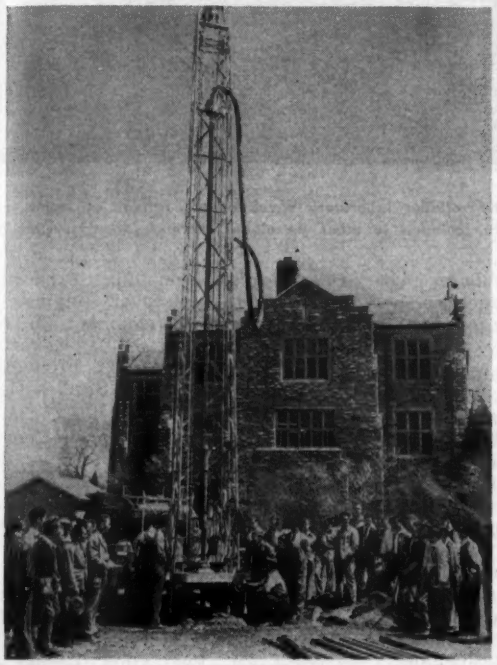

Left: Waite Phillips Engineering Building

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SALIENT FACTS AND FIGURES

General.—Founded in 1894 as Henry Kendall College at Muskogee, I. T., and moved to Tulsa in 1907. Coeducational, privately endowed. Includes six schools or divisions. Enrollment during 1946-47 was about 4,000.

Calendar.—Two regular (fall and spring) semesters and an 8-weeks summer session.

Fees.—Varies with school or division. For school of petroleum sciences and engineering, $160 per regular semester which includes all fees except breakage deposits.

Buildings and grounds.—Main campus of 42 acres, 12 permanent buildings, 17 temporary buildings, and the Downtown College building. The university operates its own FM broadcasting station.

THE school of petroleum sciences and engineering (founded in 1928) of University of Tulsa is distinguished by the large variety of specialized courses offered (about 50) and the number (7) of specialized degrees granted.

Dean of engineering, R. L. Langenheim, is also vice president of the university. Heads of departments are: C. V. Sidwell—production; W. L. Nelson—refining; A. N. Murray—geology; P. J. Kaufmann—chemistry; and V. L. Jones—geophysics. Faculty member Dr. Paul Zurcher specializes in treating and dewaxing; Paul A. Buthod in chemical engineering and thermodynamics of refining; R. G. Ruth in laboratory operations in oil-industry materials; W. B. Bleakley in gas engineering and production; H. W. Walker in production practice; and F. T. Gardner in petroleum chemistry. Members of the faculty have spent an average of 15 years each, in teaching or commercial practice in the oil industry.

Department heads Sidwell and Nelson have conducted field and plant operations for many years and are well known as consultants to the industry. Before joining the university, Sidwell spent 21 years in production practice—4 years in Mexico and 17 years with the Standard Oil Co. (Indiana); Amerada Petroleum Corp., British-American Oil Co., and Northern Ordnance. The McGraw-Hill book, Petroleum Refinery Engineering, by Nelson, is used by most petroleum engineering schools and many chemical-engineering schools. During World War II, the Quartermaster Petroleum School of the U. S. Army was conducted at University of Tulsa.

In the enrollment in the College of Petroleum Sciences and Engineering for the year 1946-47, 219 students had already selected production as a major, and 76 had selected refining. During 1946-47 in the College of Petroleum Sciences and Engineering, there were 283 freshmen, 147 sophomores, 96 juniors, 38 seniors, and 25 graduate students. This total of 564 compares with a total enrollment of 308 in 1945-46, and of 240 in 1940-41.

Specialized petroleum degrees offered by the school include Bachelor of Science in petroleum engineering—production option and refining option, geophysical engineering, geological (petroleum) engineering; and

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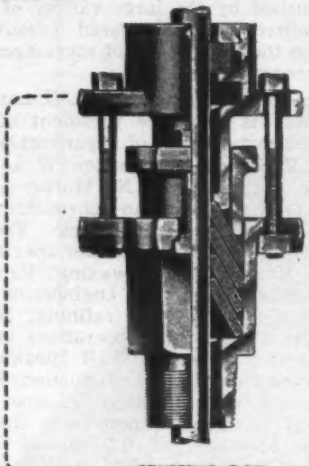

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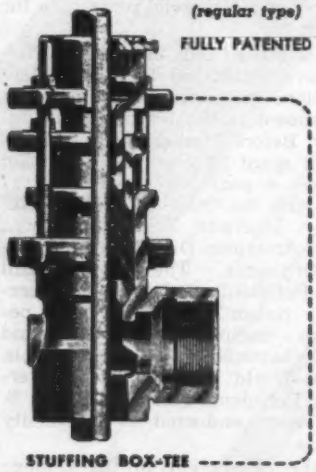

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Master of Science in petroleum engineering (refining or production), petroleum sciences (refining, production or chemistry), and geology.

The following scholarships and fellowships are offered: M. W. Kellogg Co., Mosier and Howard scholarships, Research Corp., and Ethyl Corp. (graduate). Major research projects during the last year pertained to oil-carbon-dioxide-brine equilibrium phase relationships, wax products and their plasticity, mean temperature differences in heat exchangers, and the removal of hydrogen sulfide from plant products. Complete laboratory facilities are available for all common production, refining and gas engineering tests, as well as much special research equipment. Estimated average starting salaries for graduates in 1941 were about $140, and in 1947 about $250.

The technical library consists of over 45,000 documents and volumes, 12,000 of which pertain to petroleum geology. In addition, the technical department of the Tulsa Public Library is one of the most complete petroleum libraries in the country. The well-sample library of the petroleum school consists of over 10,000 cataloged sets of well cuttings comprising 30,000,000 individual samples.

In the following paragraphs are listed most of the approximately 50 specialized petroleum courses (over 120 credit hours). In addition, more than 25 courses (over 80 credit hours) are available to students of petroleum geology. (Figures in parentheses are credit hours.)

Production and natural-gas courses are: The Petroleum Industry (3), Petroleum Development (3), Special Development Laboratory (1), Development Laboratory (1), Production Methods (3), Natural-Gas Engineering (2), Natural Gas Laboratory (1), Gas Transmission (2), Production Problems (2), Reservoir Engineering (3), Advanced Development (3), Advanced Production (3), Advanced Production Problems (2), Production Seminar (1-3), Special Studies (1-3), Production Research (4-10).

Geophysics courses are: General Geophysics (3), Seismic Exploration (3), Gravitational Exploration (3), Spectrum Analysis (3), Magnetic and Electrical Exploration (3), Radioactivity (3), Isostasy (3), Theory of Potential Fields (2).

Refining and petroleum chemistry are: Petroleum Refining (3), Routine Test Methods (1), Treating and Dewaxing (2), Evaluation Laboratory (1), Refinery Design (3), Gas and Refinery Processes (3), Reactions of Hydrocarbons (2), Thermodynamics of Hydrocarbons (2), Heaters and Cracking (3), Fractionation and Gas Absorption (3), Solvent Treating Methods (2), Refinery Products (2), Liquefied Petroleum Gases (2), Refinery Studies (1-3), Contemporary Refining (1), Refinery Research (4-10), Empirical Equations (3).

BOOKS

OIL AND PETROLEUM YEAR BOOK. Compiled by Walter E. Skinner, 20 Copthall Avenue, London E.C. 2, England. $4. Post free abroad.

The 1947 edition of this standard reference work gives complete and up-to-date particulars covering all branches of the oil industry. American and foreign companies are included. The particulars of each company comprise names of directors and other officials, seat of operation, description of business, crude-oil production, details of capital, dividends, and financial results. Other useful features are names and addresses of 320 managers and engineers and the names of the companies in the book with which they are associated, and a buyers' guide of manufacturers of oilfield and refinery equipment, comprising nearly 500 headings.

Trends in Supply of High-Sulfur Crude Oils in the United States

by H. M. Smith and O. C. Blade

DURING the past few years there have been many statements to the effect that future supplies of crude oil would include an increasingly large proportion with a relatively high content of sulfur. To the writers' knowledge, such statements have never been accompanied by factual information which would either prove or disprove the validity of such conclusions. What actually is the situation?

Is the production of crude oil with a high content of sulfur increasing more rapidly than the production increase of low-sulfur crude oil?

Or is low-sulfur crude-oil production increasing at all?

What is the history of the various major producing areas of the country as regards sulfur in petroleum?

Where are the major oil fields today, and what is the sulfur content of the petroleum produced from these fields?

What are the prospects for new large fields; i.e., will they produce high or low-sulfur crude oils?

These are some of the questions that should be answered to obtain a proper background from which may be developed some conclusions regarding the future trends in the production of high-sulfur crude oils. . . .

1946 Data by Producing Districts

Fig. 1 portrays the production data on sulfur contents of crude oil produced in 1946. Division into nine major producing areas is as follows: California; Rocky Mountain (Colorado, Montana, Wyoming); West Texas-New Mexico; Gulf Coast (Louisiana and Texas); Southeastern (Mississippi); Mid-Continent (Arkansas, Kansas, North Louisiana, Oklahoma, rest of Texas); Illinois-Southwest Indiana-Western Kentucky; Michigan-Lima; Appalachian (New York, Pennsylvania, West Virginia, Eastern Kentucky, Eastern Ohio, Tennessee).

California production was 18 per cent of the nation's total, an increase of about 2 per cent over 1940. Some of this increase appears to have taken place in the low-sulfur-content crude oils, apparently caused by new developments in the Coalinga and other areas. Some of the older California fields have decreased in production; but other fields, such as Wilmington and Santa Maria Valley, came to the fore, and the net result was very little change in the distribution.

Production increased in the Rocky Mountain region to slightly over 3 per cent above 1940, and in 1946, 73 per cent of the oil had 0.5 per cent sulfur or more. A rather large portion of this was in the groups having 1 to 2 per cent sulfur or more than 2 per cent sulfur. Elk Basin and Oregon Basin fields contributed to these higher-sulfur oils, and a large increase in the group having 0.5 per cent to 1 per cent sulfur was

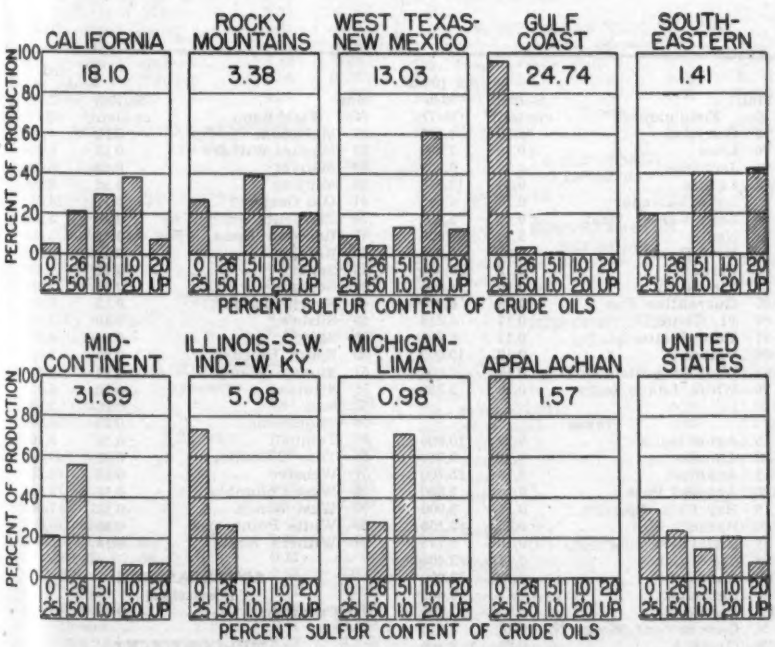


Fig. 1—Sulfur content of U. S. crude oils—1946. The ordinates of the individual bar graphs of these charts represent the percentage of the total crude oil produced within the district indicated by name above the chart. On the abscissa are the five groups into which the sulfur content has been divided. At the top of each bar graph is given a figure which represents the total percentage of the United States crude-oil production contributed by the district indicated

H. M. SMITH

O. C. BLADE

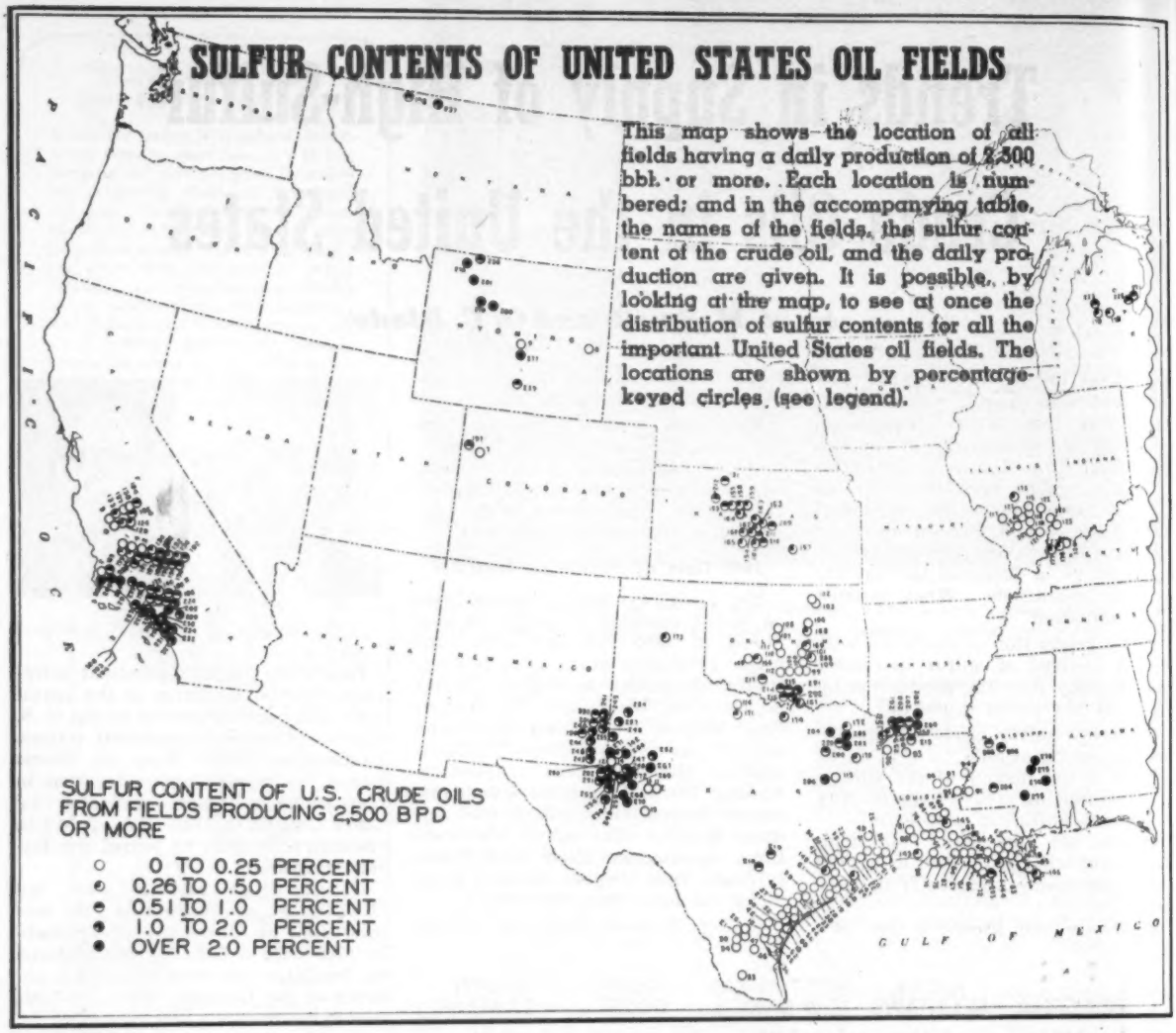
Harold M. Smith is principal petroleum chemist in charge of the chemistry and refining section at the U. S. Bureau of Mines experiment station, Bartlesville, Okla. Born in Rhode Island, he received his education in Massachusetts, being graduated by Clark College in 1922 (B.A., A.M.) in chemistry. In 1923 he joined the Bureau of Mines.

O. C. Blade also is with the U. S. B. M. at Bartlesville. He was graduated by University of Colorado in 1926 with a B.A., having majored in chemistry. He then accepted a position at the Laramie, Wyo., field office of the bureau.

Portion of paper presented at annual meeting of the A.P.I., Chicago, November 10-13. (Omitted here are historical discussions and production data during 1915-1940.)

(A related article on "Sour Crude Equipment Protection" appears on page 83.)

SULFUR CONTENTS OF UNITED STATES OIL FIELDS


This map shows the location of all fields having a daily production of 2,500 bbl. or more. Each location is numbered; and in the accompanying table, the names of the fields, the sulfur content of the crude oil, and the daily production are given. It is possible, by looking at the map, to see at once the distribution of sulfur contents for all the important United States oil fields. The locations are shown by percentage-keyed circles (see legend).
SULFUR CONTENT OF U.S. CRUDE OILS FROM FIELDS PRODUCING 2,500 B P D OR MORE
0 TO 0.25 PERCENT
0.26 TO 0.50 PERCENT
0.51 TO 1.0 PERCENT
1.0 TO 2.0 PERCENT
OVER 2.0 PERCENT
GULF OF MEXICO

Sulfur Content—0 to 0.25 Per Cent

CALIFORNIA

Map No.	Field name—	Sulfur content*	Av. prod. 1946 (B/D)
1	Belridge, North	<0.10	5,111
2	Elwood	0.18	7,213
3	Helm	0.21	4,343
4	Paloma	0.10	7,371
5	Rio Bravo	0.22	12,986
6	Riverdale	0.22	4,223

ROCKY MOUNTAINS

Colorado

7	Wilson Creek	0.11	6,950

Wyoming

8	Lance Creek	<0.10	11,975
9	Salt Creek	0.24	12,600

WEST TEXAS-NEW MEXICO

Texas

10	Barnhart	<0.10	3,600
11	Big Lake	0.18	3,400
12	Embar	0.18	4,000
13	Todd, Deep	0.15	8,500
14	TXL	0.19	26,100

GULF COAST

Louisiana

62	Anse la Butte	0.17	6,700
63	Barataria	0.14	3,950
64	Bayou Sale	<0.10	9,950
65	Bosco	<0.10	2,952
66	Caillou Island	0.18	6,650
67	Charenton	<0.10	4,000
68	Delta Farms	0.22	13,800
69	Eola	<0.10	4,570
70	Erath	<0.10	18,000
71	Garden Island Bay	0.15	3,750
72	Gibson and Gibson, NE	<0.10	8,502
73	Golden Meadow	<0.10	7,531
74	Grand Bay	0.14	8,550
75	Gueydan	0.17	4,503
76	Iowa	<0.10	7,303
77	Jennings	0.15	5,203
78	Lafitte	0.14	12,600
79	Lake Salvador	0.13	4,650
80	Lake Verret, West	<0.10	3,200
81	Neale	0.14	3,400
82	New Iberia	0.21	4,375
83	Paradis	0.12	10,000
84	Pine Prairie	<0.10	5,000
85	Quarantine Bay	0.12	8,775
86	St. Gabriel	0.17	4,818
87	Ville Platte	0.11	7,308
88	Vinton	0.19	10,000
89	West Cote Blanche Bay	0.15	2,900
90	White Lake, East	<0.10	3,852

Texas

15	Agua Dulce	<0.10	10,000
16	Amelia	0.20	3,750
17	Anahuac	0.13	25,200
18	Aransas Pass	<0.10	2,600
19	Bay City, No.	0.11	3,900
20	Barbers Hill	0.15	5,150
21	Benavides	<0.10	2,775
22	Clear Lake	0.17	3,400
23	Conroe	0.12	53,000
24	Fairbanks	0.11	5,600
25	Fannett	0.21	7,600
26	Government Wells, N.	0.16	3,975
27	Greta	0.22	8,700
28	Hastings	0.24	51,100
29	Heyser	0.13	5,050
30	Hoffman	0.14	2,775
31	Hull	0.20	3,000
32	La Rosa	<0.10	3,250
33	Lolita	0.15	5,125
34	Loma Novia	0.10	2,900
35	Lovell's Lake	<0.10	3,750
36	Luby	<0.10	2,500
37	McFaddin	0.11	4,900
38	Magnet-Withers	0.15	6,800
39	Manvel	0.19	6,400
40	Midway	0.12	3,000
41	Old Ocean	0.11	14,750
42	Plymouth	<0.10	8,825
43	Raccoon Bend	0.10	5,600
44	Refugio	0.14	3,625
45	Saxet	0.12	7,000
46	Seeligson	<0.10	33,000
47	Seven Sisters	0.13	6,050
49	Silsbee	<0.10	2,500
48	Slick	0.17	4,100
50	South Houston	0.20	3,800
51	Stowell-Winnie	0.17	10,250
52	Stratton	<0.10	6,100
53	Sun	<0.10	2,800
54	Thompson	0.20	25,000
55	Tomball	<0.10	8,100
56	Tom O'Connor	0.21	40,000
57	Webster	0.16	48,500
58	West Columbia	0.19	3,850
59	West Ranch	0.13	17,500
60	White Point, East	0.10	10,000
61	Withers, North	0.16	6,000

SOUTHEASTERN

Mississippi

91	Cranfield	0.12	14,679

MID-CONTINENT

Arkansas

98	Dorcheat	<0.10	3,986

Louisiana

92	Caddo	0.20	9,375
93	Cotton Valley	<0.10	5,970
94	Holly Ridge	<0.10	3,410
95	Lake St. John	0.13	14,550
96	Nebo	<0.10	7,375
97	Olla	0.13	6,265

Map No.	Field name—	Sulfur content*	Av. prod. 1946 (B/D)
	Oklahoma		
99	Allen	0.24	2,910
100	Antioch	0.14	5,350
101	Bowlegs	0.20	3,150
102	Burbank	0.20	7,700
103	Burbank, South	0.18	4,700
104	Cement	0.21	13,900
105	Crescent	<0.10	4,015
106	Cushing	0.25	7,550
107	Edmond, West	0.15	43,400
108	Fitts	0.16	3,750
109	Little River	0.25	2,910
110	Moore	0.12	6,240
111	Oklahoma City	0.16	27,450
112	Pauls Valley	0.17	5,425
	Texas		
114	KMA	0.20	16,623
113	Long Lake	<0.10	4,250
	ILLINOIS, SOUTHWEST INDIANA, WESTERN KENTUCKY		
	Illinois		
115	Bible Grove	0.17	3,590
116	Boyd	0.14	3,975
117	Centralia	0.15	4,675
118	Clay City	0.15	20,500
287	Hoodville	0.20	3,700
119	Johnsonville	0.18	2,775
120	Mount Carmel	0.25	2,550
121	New Harmony	0.24	7,990
122	Noble	0.15	4,300
123	Patoka	0.16	4,450
124	Salem	0.21	15,650
	Indiana		
125	Griffin	0.25	4,650
	Kentucky		
126	Poole	0.22	3,050
	APPALACHIAN		
127	Allegany, N. Y.†	0.17	9,500
128	Bradford, Pa.†	0.11	35,800

Sulfur Content—0.26 to 0.50 Per Cent

Map No.	Field name—	Sulfur content*	Av. prod. 1946 (B/D)
	CALIFORNIA		
129	Coalinga, Northeast	0.31	56,893
130	Coles Levee, North	0.50	16,150
132	Greeley	0.29	10,506
133	Jacalitos	0.34	4,169
134	Kettleman, N. Dome	0.50	37,990
136	Mountain View	0.44	4,702
137	Pleasant Valley	0.35	3,443
138	Raisin City	0.41	2,942
139	Round Mountain	0.43	8,946
140	Santa Fe Springs	0.26	16,685
141	Ten Section	0.37	8,938
	WEST TEXAS-NEW MEXICO		
	Texas		
142	Fullerton	0.48	27,815
	GULF COAST		
	Louisiana		
143	Hackberry, East	0.26	4,000
144	Leeville	0.38	3,914
145	Porte Barre	0.29	2,900
146	West Bay	0.26	3,500
	Texas		
147	High Island	0.26	2,600
149	Sugarland	0.30	4,000
	MID-CONTINENT		
	Arkansas		
150	Atlanta	0.48	4,283
151	McKamie	0.26	2,887
	Kansas		
154	Bloomer	0.30	8,125
155	Burnett	0.45	8,350
156	Chase	0.26	7,050
157	El Dorado	0.27	7,025
158	Gorham	0.47	4,960
159	Hall-Gurney	0.35	9,225
160	Kraft-Prusa	0.27	15,285
161	Peace Creek	0.32	4,025
162	Silica	0.31	13,950
163	Stoltenberg	0.32	7,250
164	Trapp	0.41	30,100
165	Zenith	0.33	3,210
	Louisiana		
152	Rodessa (Louisiana, Texas, Arkansas)	0.30	8,142
	Oklahoma		
166	Apache	0.38	4,525
167	Cumberland	0.46	10,750
168	Glennpool	0.35	6,650
288	St. Louis	0.36	4,025
169	Seminole	0.27	3,650
	Texas		
170	East Texas	0.30	316,000
171	Hull-Silk-Sikes	0.48	9,766
172	New Hope	0.41	3,050
173	Panhandle	0.38	75,800
174	Walnut Bend	0.37	3,911
	ILLINOIS, SOUTHWESTERN INDIANA, WESTERN KENTUCKY		
	Illinois		
175	Loudon	0.26	21,500
	Kentucky		
176	Smith Mills	0.39	2,925
177	Uniontown	0.26	5,160
	MICHIGAN-LIMA		
	Michigan		
178	Coldwater	0.30	4,603
179	Fork	0.32	3,226

Sulfur Content—0.51 to 1.0 Per Cent

Map No.	Field name—	Sulfur content*	Av. prod. 1946 (B/D)
	CALIFORNIA		
180	Aliso Canyon	0.67	3,343
181	Belridge, South	0.86	10,273
182	Buena Vista	0.59	44,850
183	Capitan	0.69	3,338
184	Coalinga, East	0.51	17,505
185	Coalinga, West	0.71	6,631
186	Dominguez	0.93	14,912
187	Edison	0.68	15,250
189	Elk Hills	0.76	8,300
188	Fruitvale	0.60	7,284
190	Kern Front	0.89	8,716
229	Kern River	0.93	9,652
191	Lost Hills	0.66	3,823
196	Midway-Sunset	0.88	42,564
135	Montebello	0.60	7,733
192	Mount Poso	0.65	15,233
193	Newhall-Potrero	0.52	5,884
194	Rosecrans	0.53	4,904
195	San Miguelito	0.93	5,675
	ROCKY MOUNTAINS		
	Colorado		
197	Rangely	0.73	25,200
	Montana		
198	Cut Bank	0.77	12,300
	Wyoming		
239	Lost Soldier	0.75	8,350
	WEST TEXAS-NEW MEXICO		
	New Mexico		
199	Grayburg-Jackson	0.95	5,250
200	Maljamar	0.70	6,175
201	Vacuum	0.87	11,000
	Texas		
202	Keystone	0.84	45,575
	GULF COAST		
	Louisiana		
203	Lake Pelto	0.53	4,000
	SOUTHEASTERN		
	Mississippi		
204	Brookhaven	0.86	10,500
205	Pickens	0.72	4,860
206	Tinsley	0.77	20,921
	MID-CONTINENT		
	Arkansas		
207	Magnolia	0.90	12,914
208	Village	0.80	3,146
	Kansas		
153	Bemis-Shutts	0.60	15,250
209	Bornholdt	0.62	3,120
210	Burrton	0.56	3,222
211	Geneseo	0.54	6,575
212	Morel	0.67	3,475
131	Ray	0.58	3,650
	Louisiana		
213	Haynesville	0.53	8,075
	Oklahoma		
214	Healdton	0.77	6,700
215	Hewitt	0.84	4,650
216	Lone Grove	0.79	4,600
217	Velma	0.81	7,350
	Texas		
218	Darst Creek	0.83	7,000
219	Luling-Branyon	0.92	3,725
220	Quitman	0.87	5,080
290	Van	0.90	24,500
	MICHIGAN-LIMA		
	Michigan		
221	Adams	0.66	3,600
222	Deep River	0.60	8,000
223	Reed City	0.54	8,047

Sulfuur Content—1.0 to 2.0 Per Cent

Map No.	Field name—	Sulfur content*	Av. prod. 1946 (B/D)
	CALIFORNIA		
289	Brea-Olinda	1.31	11,402
224	Coyote, East	1.44	4,512
225	Coyote, West	1.21	14,708
226	Del Valle	1.14	4,731
227	Huntington Beach	1.26	47,899
228	Inglewood	1.84	11,979
230	Long Beach	1.34	24,180
231	Newport Beach	1.99	6,904
232	Richfield	1.09	6,689
233	Rincon	1.11	4,133
234	Seal Beach	1.23	10,693
235	Ventura Avenue	1.17	44,906
236	Wilmington	1.24	117,667
	ROCKY MOUNTAINS		
	Montana		
237	Kevin-Sunburst	1.47	5,000
	Wyoming		
238	Elk Basin	1.72	11,500
	WEST TEXAS-NEW MEXICO		
	New Mexico		
240	Arrowhead	1.30	4,400
241	Eunice	1.24	13,750
242	Hobbs	1.45	9,750
243	Langlie	1.35	3,400
244	Loco Hills	1.02	2,600
245	Monument	1.39	17,675
246	Penrose-Skelly	1.04	3,515
	Texas		
247	Cowden, North	1.66	21,000
248	Cowden, South	1.38	2,700
249	Foster	1.07	17,000
250	Goldsmith	1.90	20,700
251	Hendrick	1.49	3,700
252	Latan-East Howard	1.40	3,750
253	Kermit	1.45	2,650
254	Slaughter	2.00	46,000
255	Seminole	1.76	18,600
256	Ward, North	1.21	9,100
257	Wasson	1.90	69,650
258	Yates	1.59	41,800
	MID-CONTINENT		
	Arkansas		
259	Midway	1.36	7,219
260	Schuler	1.54	8,985
261	Stephens	1.99	4,455
	Oklahoma		
291	Tatums	1.67	4,025
292	Tussy	1.54	2,725
	Texas		
286	Cayuga	1.90	6,500

Sulfur Content—2.0 Per Cent

Map No.	Field name—	Sulfur content*	Av. prod. 1946 (B/D)
	CALIFORNIA		
262	Gato Ridge	5.21	3,574
263	Santa Maria	2.63	13,520
264	Santa Maria Valley	4.73	30,798
265	Torrance	3.29	8,299
	WEST TEXAS-NEW MEXICO		
	Texas		
266	Fuhrman-Mascho	4.17	3,650
267	Howard-Glasscock	2.76	14,000
268	Jordan	2.13	5,350
269	McCamey	2.23	8,200
270	McElroy	2.39	27,000
271	Means	2.36	3,500
272	Penwell	2.59	2,700
	SOUTHEASTERN		
	Mississippi		
273	Baxterville	3.07	8,061
274	Eucutta	3.89	6,805
275	Heidelberg	3.50	13,569
276	Heidelberg, East	3.50	10,026
	ROCKY MOUNTAINS		
	Wyoming		
277	Byron	2.42	5,850
278	Frannie	2.52	3,450
279	Grass Creek	2.72	3,950
280	Hamilton Dome	2.30	2,625
281	Oregon Basin	3.27	9,450
	MID-CONTINENT		
	Arkansas		
282	Smackover	2.36	11,365
	Texas		
283	Hawkins	2.45	39,200
284	Sulphur Bluff	2.95	3,350
285	Talco	2.98	24,000

*<Symbol = "less than." †Not on map.

caused by Rangely (Colorado) field. Lance Creek and Salt Creek fields continued to be sources of very low-sulfur crude oils in the Rocky Mountain region.

West Texas-New Mexico production increased from 9 to 13 per cent between 1940 and 1946, and there were some changes in distribution caused primarily by the development of production from the Ellenburger formation, which yields a low-sulfur-content oil. As a result, in 1946, 13 per cent of the West Texas production had less than 0.5 per cent sulfur; whereas only 3 per cent was in this range in 1940. As a corollary, there has been a slight decrease in the percentage of the extremely high-sulfur-content oils.

The Gulf Coast area produced almost 25 per cent of the nation's total, but its distribution remained unchanged. It was still almost 100 per cent in the very low-sulfur group.

The Southeastern area, particularly Mississippi, almost quintupled its percentage of the country's total production since 1940, and in 1946 it amounted to 1.4 per cent. The very-low-sulfur group furnished 20 per cent of this production, mostly from Cranfield field. Tinsley field was a large contributor to the group having 0.5 to 1 per cent sulfur, and Heidelberg field to the extremely high-sulfur oil.

The Mid-Continent area, which decreased in production to about 32 per cent from 1940, had very little change in distribution. However, the trend noted in 1940 toward slightly higher quantities of high-sulfur oils seems to have continued; whereas, in 1940, 18 per cent of the production had above 0.5 per cent sulfur; and in 1946, 23 per cent was in that class. Such fields as Talco, Hawkins, and Van in Texas; Bemis-Shutts in Kansas; and Magnolia, in Arkansas, accounted for these increases in high-sulfur oils.

Illinois oil production in 1946 decreased to 5 per cent of the nation's total, but its distribution as regards sulfur-containing oils is approximately the same. Michigan produced about 1 per cent of the 1946 total crude oil; 28 per cent of the district's oil contained less than 0.5 per cent sulfur, and the remainder was in the group having 0.5 to 1 per cent sulfur. Deep River and Reed City fields were the contributors in this area. The Appalachian area still had the same story —decrease in percentage of production and no change in distribution.

Over-all picture for the United States shows a decrease in the proportion of crude oil having less than 0.5 per cent sulfur. In 1940 it was 67 per cent; in 1946 it was 58 per cent. This was caused to a considerable extent by the increased production in the California, Rocky Mountain, and West Texas areas, where high-sulfur crude oils predominate, and to a decrease in production in the Mid-Continent area and in Illinois.

Comparison of 1946 Crude-Oil Production with Estimated Reserves

In considering the future production of high-sulfur crude oils, a comparison between the 1946 production according to various sulfur groups and the estimated reserves; divided according to the same sulfur groups, should be significant. Fig. 2 is a chart, prepared similarly to that which has been used to present production figures, but based on the estimated reserves as of January 1, 1947.

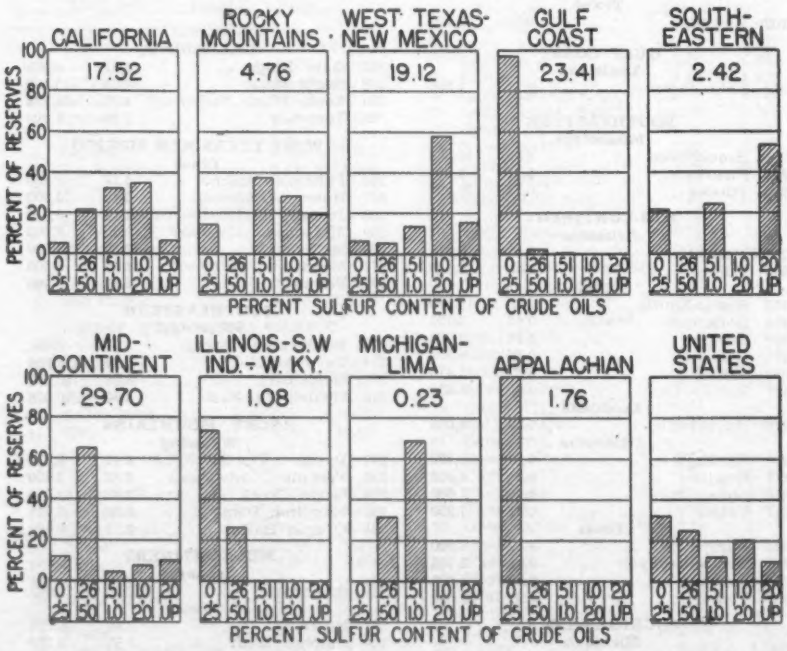


Fig. 2—Sulfur content of U. S. crude-oil reserves—1946 (Cutline of Fig. 1 explains chart)

Most striking thing about the whole chart is that it almost exactly duplicates the production chart for 1946. This would certainly seem to indicate that crude oil is being produced in almost all of the fields at a constant ratio to the reserves available in those fields.

Significant feature of this fact is that, as long as crude-oil demand requires full production from all fields, no change can be expected in the quantity of high-sulfur crude oil that will be produced. The only factors that could make a change would be: (1) a decrease in demand that would decrease the importance of the high-sulfur oil; or, (2) discovery of new fields. These fields might yield low-sulfur oil which, of course, would increase its proportion; but, on the contrary, the new fields may have high-sulfur oil, and the ratio of high to low-sulfur crude oils would become even greater than it is at present. . . .

Production in Terms of Barrels of Crude Oil Produced

Up to this point, the discussion of crude-oil production and related sulfur content has been entirely in terms of percentage. This presents a true picture of the relative ratios of the various types of oils that are produced, but does not give any indication of the quantity of oils of high-sulfur content with which the refiners must contend. To bring out this point, the next several figures will present data for four districts of the United States that produce high-sulfur crude oils, showing the production changes in those districts, for the same years previously considered, in terms of millions of barrels of oil produced, and distributed according to the same sulfur groupings which have been used previously herein.

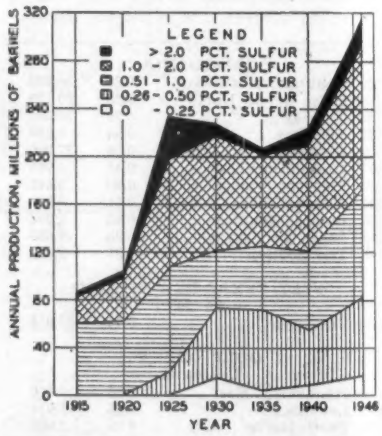

LEGEND
> 2.0 PCT. SULFUR
1.0 - 2.0 PCT. SULFUR
0.51 - 1.0 PCT. SULFUR
0.26 - 0.50 PCT. SULFUR
0 - 0.25 PCT. SULFUR
ANNUAL PRODUCTION, MILLIONS OF BARRELS
0 40 80 120 160 200 240 280 320
1915 1920 1925 1930 1935 1940 1946
YEAR

Fig. 3—Crude-oil production for 5-year intervals, 1915-1946, grouped according to sulfur content—California

California.—Fig. 3 (which is also typical of the next several figures) shows the millions of barrels of crude oil produced annually in California for each of the years indicated, and

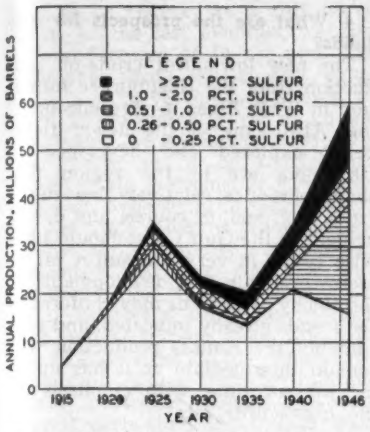


Fig. 4—Crude-oil production for 5-year intervals, 1915-1946, grouped according to sulfur content—Rocky Mountains

having sulfur contents as shown by the shadings in the graph. . . .

Production in 1946 had increases that became greater as the sulfur content of the crude oil increased, except for the group having over 2 per cent sulfur. The net result, therefore, was that there were 83 million barrels of crude oil having less than 0.5 per cent sulfur and 233 million barrels of crude oil having more than 0.5 per cent sulfur, which is a greater quantity of high-sulfur crude oil than has been produced in California at any time.

Rocky Mountains.—Fig. 4 portrays similar production figures for the Rocky Mountains. Up to 1940, most of the production, even though it had been relatively small, had been of crude oil having less than 0.25 per cent sulfur. At that time the production of high-sulfur crude oils accelerated to such an extent that, although 20 million barrels of very low-sulfur crude oil were produced, about 15 million barrels of high-sulfur crude oil were produced. By 1946 this trend had become still more pronounced. The production of low-sulfur crude oil had decreased to about

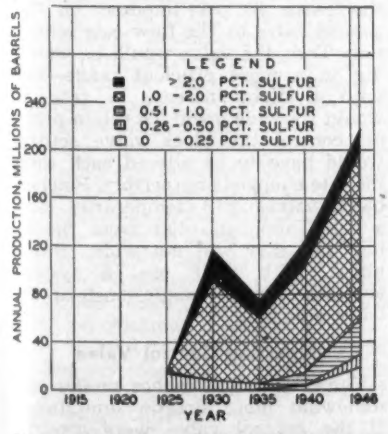


Fig. 5—Crude-oil production for 5-year intervals, 1915-1946, grouped according to sulfur content—West Texas-New Mexico

16 million barrels, whereas the high-sulfur oil had increased to about 43 million barrels. A very interesting feature of the Rocky Mountain production is the almost complete absence of crude oils in the range of 0.26 to 0.50 per cent sulfur.

West Texas-New Mexico.—Fig. 5 presents production data for the West Texas-New Mexico area. There was no recorded production from this area in 1915 and 1920.

In the interval since 1940, as reflected by the figures for 1946, tremendous increases in production have occurred. Thus, in 1946, 178 million barrels of crude oil having a sulfur content of 0.5 per cent or more were produced, and by far the biggest proportion of this contained 1 to 2 per cent sulfur. There is one encouraging feature, i.e., the increase of crude oil from the Ellenburger formation, which in 1946 accounted for about 30 million barrels per year of crude oil

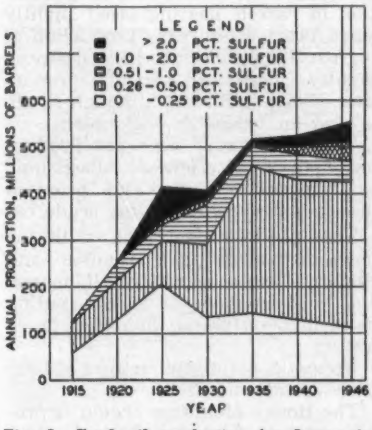


Fig. 6—Crude-oil production for 5-year intervals, 1915-1946, grouped according to sulfur content—Mid-Continent

having less than 0.5 per cent sulfur, most of it less than 0.25 per cent.

Mid-Continent.—Fig. 6 presents typical data for the Mid-Continent district. . . .

If 0.5 per cent sulfur is taken as the dividing line between high and low-sulfur crude oils, there is very little difference between 1925 and 1930; however, by 1935 East Texas had become a contributing factor, and about 460 million barrels of crude oil having less than 0.5 per cent sulfur were produced in that year, compared with about 55 million barrels having more than 0.5 per cent sulfur. Since 1935 the quantity of crude oil having

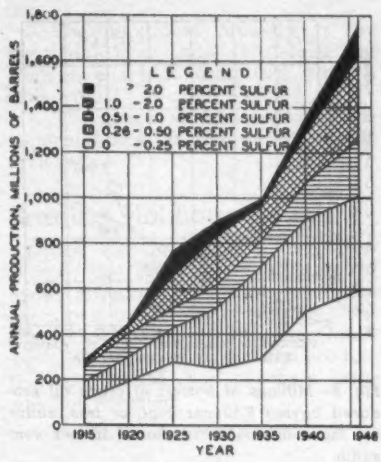


Fig. 7—Crude-oil production for 5-year intervals, 1915-1946, grouped according to sulfur content—United States

less than 0.5 per cent sulfur has decreased to a figure, in 1946, of about 425 million barrels; but the production of fields such as Hawkins and Talco in Texas has increased the output of high-sulfur crude oils, and in 1946 there were about 154 million barrels of such crude oil from the Mid-Continent area, which is higher than for any previous time.

United States.—In Fig. 7 the data just reviewed for several of the districts, combined with the data from other districts not individually presented, have been combined to give over-all production for the United States during 1915 to 1946. . . .

In 1946, there continued to be an increase in the production of extremely low-sulfur crude oil, amounting to 600 million barrels having less than 0.25 per cent sulfur. Production of low-sulfur crude oil has not increased so rapidly as has the production of the high-sulfur-containing oils, however; for, in 1946, approximately 1,014 million barrels of crude oil were produced having less than 0.5 per cent sulfur and 735 million barrels of crude oil having more than 0.5 per cent sulfur. This is a greater volume of high-sulfur crude oil (if the dividing line is taken at 0.5 per cent sulfur) than at any previous time.

These relationships can be seen more clearly by reference to Fig. 8, in which the millions of barrels of crude oil produced having less than 0.5 per cent sulfur are plotted against the millions of barrels having more than 0.5 per cent sulfur for each of the several years indicated.

TABLE 1—UNITED STATES CRUDE-OIL PRODUCTION

Year	High-sulfur (Over 0.5 per cent sulfur)		Low-sulfur (0 to 0.5 per cent sulfur)		Ratio of high-sulfur to low-sulfur
	Millions of bbl.	Per cent	Millions of bbl.	Per cent	
1915	95	34	186	66	0.51
1920	144	33	299	67	0.48
1925	339	44	425	56	0.80
1930	382	43	516	57	0.74
1935	295	30	702	70	0.42
1940	444	33	909	67	0.49
1946	735	42	1,014	58	0.72

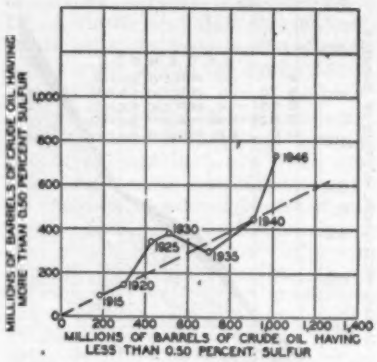


Fig. 8—Millions of barrels of crude oil produced having 0.50 per cent, or less, sulfur vs. those having more than 0.50 per cent sulfur

These data are also given in Table 1.

The curve plainly shows the increase in the high-sulfur production during 1925 and 1930, shows that in 1935 the ratio of high to low-sulfur oils became even smaller than in 1915 and 1920 (the point is below a line extended from that connecting 1915 and 1920); that it was approximately the same in 1940 as in 1920; but in 1946 the ratio has jumped to another high. Remembering the data presented on reserves, which showed that the reserves had the same approximate ratio between high and low-sulfur crude oils as does 1946 production, it would appear that this ratio would remain approximately at the 1946 value as long as current demands for crude oil remain the same, and so long as no large fields are discovered. A new "East Texas field" could, of course, change the ratio, just as it did between 1930 and 1935.

This brings out an important fact, i.e., that today we tend to base our evaluation of the quality of current crude-oil production in terms of 1935 and 1940 values; further, that production in 1925 and 1930, although it had almost the same percentage of high-sulfur crude oils as of today, was confined largely to the California area, except for the Smackover (Arkansas) production. For this reason, it did not affect Mid-Continent and Eastern refiners, but today's production of high-sulfur crude oil comes not only from California, but from the West Texas, Mid-Continent, Southeastern, and Rocky Mountain areas. . . .

Conclusions

At the beginning of this paper several questions regarding high-sulfur crudes were propounded. As a result of the data that have been assembled in this paper, it is now possible to answer some of these questions:

1. Is the production of crude oil having a high content of sulfur increasing or decreasing more rapidly than the production of low-sulfur crude oil? Or is low-sulfur crude-oil production increasing at all?

In terms of both percentage of crude oil and barrels of crude oil produced, there has been an increase in the high-sulfur crude oil from 1940 to 1946. On the same basis, the percentage of low-sulfur crude oil has decreased; but its volume in barrels has increased—not as rapidly, however, as the increase in high-sulfur crude oil.

If the reserves as estimated for January 1, 1947, can be used as a guide, it would appear that the increase in high-sulfur crude oils should not continue further, but that the ratio between high-sulfur and low-sulfur crude oils should become stabilized at about the point it was in 1946—unless new fields of considerable magnitude are discovered.

2. What is the history of the various major oil-producing areas of the country as regards sulfur-containing petroleum?

California production is largely in the high-sulfur class, and its production in barrels has increased slightly since 1940. West Texas production of high-sulfur crude oil has increased greatly since 1940; and the production of low-sulfur oil, although small, is also increasing in this area.

The Gulf Coast does not produce any high-sulfur crude oil. Mississippi, as its production increases, provides more and more high-sulfur crude oil.

The Mid-Continent area, with the new discoveries in Arkansas and eastern Texas, southern Oklahoma, and western Kansas, is contributing more high-sulfur oil than ever in its history.

Illinois is definitely an area of low-sulfur crude oil.

The Rocky Mountain region is producing more high-sulfur crude than at any previous time.

3. Where are the major fields today, and what is the sulfur content of the petroleum produced from these fields?

The major oil fields today are located in five or six districts, viz.: California, West Texas-New Mexico, Gulf Coast, Mid-Continent; and probably the Rocky Mountain and Mississippi regions should also be considered. In general, the sulfur content of these oils is as follows: California is typified by large production having more than 1 per cent sulfur and a considerable quantity having more than 2 per cent sulfur. The West Texas-New Mexico area likewise has considerable yield having greater than 2 per cent sulfur, and most all of it has over 1 per cent sulfur. The Gulf Coast produces virtually no high-sulfur crude oils. Mississippi, for the most part, produces crude oil having sulfur contents ranging from 1 to 2 per cent. This is also true of fields such as Talco and Hawkins in the East Texas area, and many of the Arkansas fields also have sulfur contents well over 1 per cent. A few of the Oklahoma fields and several Rocky Mountain fields also are in this category.

4. What are the prospects for new fields?

The new low-sulfur crude-oil production from the Ellenburger formation in West Texas is very encouraging. Also some of the newer fields being explored and developed in Oklahoma are in the region that should produce relatively low-sulfur crude oils; and, of course, any development in the Gulf Coast should likewise result in very low-sulfur oil. It seems probable that developments in the Rocky Mountains may conform to the trends already indicated, and presumably the Kansas production will remain intermediate as it has up to the present time, with emphasis on the high-sulfur oils.

Give the Control Valve A Chance

(Continued from page 66)

10 to only 1.6 psi.; the maximum capacity of the valve at this pressure drop is only 40 g.p.m. Obviously, then, the flow rate cannot be increased by 10 per cent. As a matter of actual fact, the valve would be wide open with an increase in rate of only 5 per cent or a mere 3 g.p.m. The distribution of pressure drop used in this last example would be practicable only if flow rates were to decrease from the design figure and, indeed, even the degree of downward change would have to be small if good control were required.

When insufficient pressure drop has been assigned to the valve this performance picture can be altered by pinching block valves or cracking bypass valves. These subterfuges are used to modify an existing condition but the original limitations on flexibility remain, or grow worse. If in the last example, the temporary flow rate were found to be one-half of the anticipated figure, the valve could be forced to operate at the original design loading by pinching a block valve in the system until it absorbed the extra 30 psi. imposed on the control valve by the flow-rate reduction. True, the valve would be working in a more efficient range—but with a slight increase in rate, it would fly wide open! To retain process control the block valve setting would have to be altered each time the rate changed appreciably. Pinched block valves will temporarily stop a valve and controller from "hunting" but they will not widen flexibility. With their use, a system becomes semiautomatic instead of truly automatic.

Bypassing Control Valve

The cracked bypass has similar but somewhat more drastic limitations. If the control valve were already wide open and more fluid were to be forced through the system, the pressure drop across the valve would

have to be reduced to a still lower figure. In the last example, we saw that an increase of 10 per cent was impossible using the control valve alone. The valve could pass only 40 g.p.m. at the pressure drop of 1.6 psi. that would be available. Therefore, the bypass would be required to accommodate the remaining 26 g.p.m. However, bypassing the control valve has the same effect as reducing control-system sensitivity. Many will remember that this was the way sensitivity was reduced in the old style, relatively off-on controllers. In a critical system, there would be the likelihood of losing control by wandering rather than by hunting, unless controller sensitivity were altered each time the bypass were opened or closed.

What makes this picture worse is the fact that the proportion of friction allotted to the control valve would became 0.033 instead of 0.20. With a small decrease in rate, say 3 or 4 g.p.m., the valve would be nearly closed and in danger of cycling or hunting, although the effect of this hunting would be minimized by the relatively steady flow through the bypass valve. The real difficulty lies in the fact that if the required flow diminished, the flow through the cracked bypass would be, in this example, 61 g.p.m. with the control valve completely shut.

In short, the use of the block valve or bypass valve to improve the performance of a poorly designed control system is, at best, a stopgap measure. True, it does make plant operation possible at rates greater or less than design flow rates. If the flows are variable, the system will require manual adjustment which makes the plant semiautomatic. These measures are by no means a substitute for the high degree of flexibility and truly automatic control that can be achieved with properly engineered valves.

Abnormal Conditions

Of course it must be recognized that under drastically abnormal conditions, the pinching of block valves is the only recourse available. The plant must run even if only on a semiautomatic basis. The foregoing comments are offered to explain why the availability of these emergency measures should not be used as a substitute for adequate valve design during the engineering of a plant. In other words, if the valves are properly selected to begin with, the plant can be made to operate with a minimum of manual adjustments over whatever range of flow rates which may be selected. If too little attention is paid to valve selection, the emergency measures of partial hand-control will become the regular operating routine.

Even though the computations required to arrive at an adequate proportion of pressure drop for the valve are all based upon the fundamental law of fluid dynamics, which specifies that the flow of a fluid through a resistance, (a pipe line, heat exchanger, nozzle, valve, etc.), is proportional to the square root of the pressure differential, or $Q = C\sqrt{h}$, the calculations are tedious and time consuming. The actual steps involved are as follows:

1. A normal pressure drop through the valve is assumed. From a valve-sizing chart, the design flow rate is determined and the valve loading computed.

2. At the abnormal flow rate, the fixed friction is computed; from this new value, the remaining friction for the valve is determined by substraction.

3. The maximum capacity at the abnormal flow rate is determined from a chart or computed with a slide rule.

4. The actual valve loading at the abnormal flow is figured by simple division.

Branine Holdings Bought

Cities Service Oil Co. has purchased the crude-oil production of Alden Branine, Wichita independent operator, in western Kansas. The properties consist of 18 leases totaling 1,960 acres with a daily production of 808 bbl. The purchase price was not revealed.

What's The Limit?

Fourteen thousand feet in the air, scientists dropped pellets of dry ice into a cloud and created a snow storm. *Now man can make snow fall where he wants it!* Will we soon create great reservoirs of moisture for arid regions by storing snow in the hills? What's the Limit?

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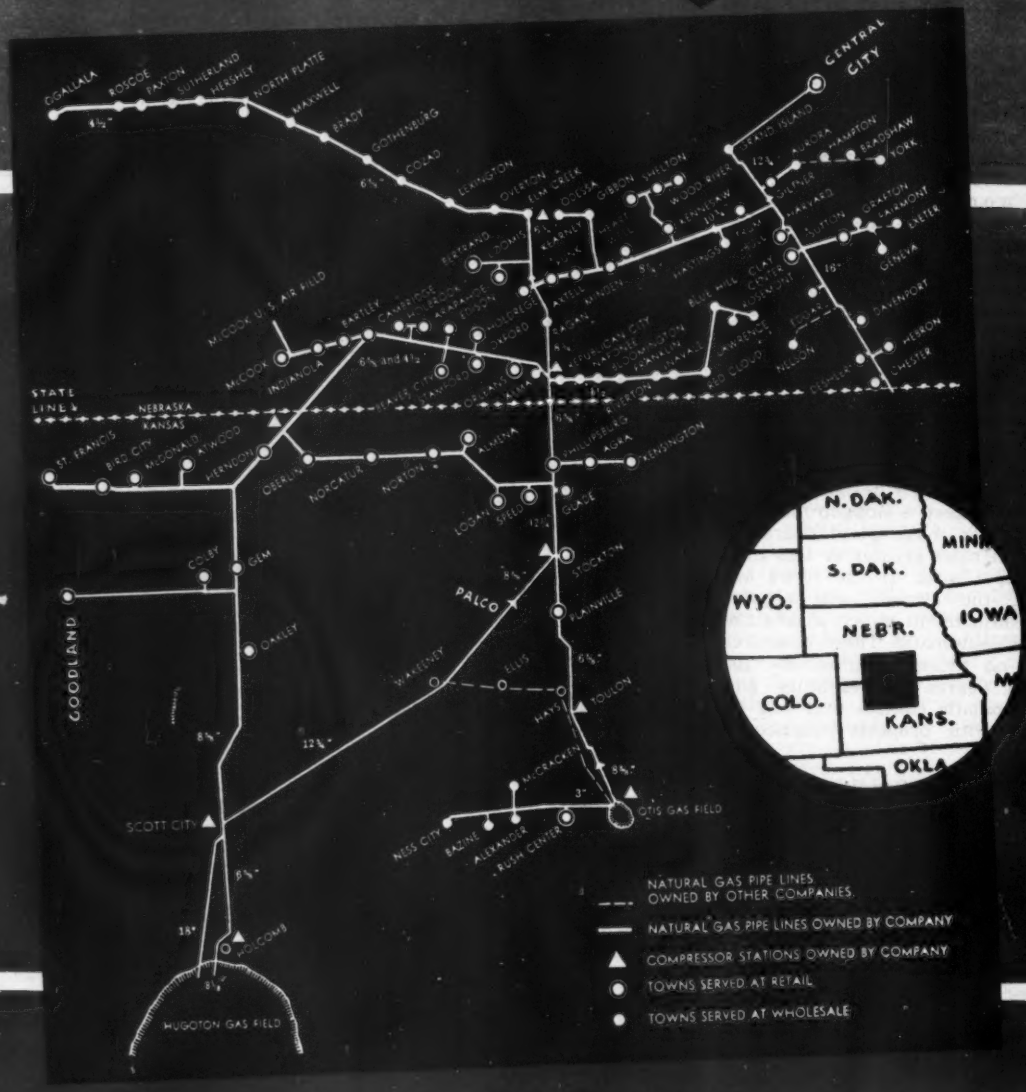
A Midwest organization uses Worthington Equipment to supply 37,500 customers with the benefits of natural gas.

The extensive — and still growing — pipeline system of the Kansas-Nebraska Natural Gas Co., Inc. Dark portion in the insert shows the area covered.



A splendid example of fast expanding American enterprise, the Kansas-Nebraska Natural Gas Co., Inc., now comprises 53 separate distribution systems, with some 1,375 miles of transmission lines. To adjoining districts in the two states, the company has brought the many advantages of low-cost natural gas for heating, cooking, refrigeration and power — while crops and prosperity have been increased through the availability of the gas for irrigation-pumping.

Sour CRUDE

EQUIPMENT PROTECTION FOR CRACKING UNITS

by E. Q. Camp

The author, with Humble Oil and Refining Co., Baytown, Tex., here discusses the corrosion encountered and methods employed in its mitigation—in cracking reduced sour crudes and sour distillates. Corrosion experienced in operation of three cracking processes is discussed: (1) Thermal cracking of reduced West Texas crude, (2) cracking of sour distillate in a fluid catalyst cracking unit, and (3) vapor-phase reforming of a light naphtha. It is believed that the corrosion discussed in connection with these three cracking processes is representative of the major corrosion problems in cracking operations generally.

This is the remaining section of the paper "Sour Crudes—Equipment Protection" presented by the author at the annual meeting of the A.P.I., Chicago, November 10-13; the first portion was published last week.

(A related article on "High-Sulfur Crude Areas" appears on page 76.)

Thermal Cracking Unit

REDUCED West Texas crude from a pipe-still operation is cracked in a partial-yield operation on a thermal cracking unit. Fig. 1 shows a flow diagram of this type of cracking operation. The residuum charge flows through a heat exchanger and is then discharged into the bottom of the primary distillation tower, where it combines with recycle stock, and then flows into the hot-feed accumulator. The total feed from the accumulator is pumped at a pressure of about 1,200 psi, through heat exchangers, and then into the furnace coil. The feed flows from the furnace coil at a temperature of about 900° F., and a pressure of about 700 psi. downflow through a soaking drum. The feed then flows through a pressure-reducing valve and is discharged into a separator, where tar is removed at the bottom and the light products pass overhead through heat exchangers, and then into the primary distillation tower. Recycle stock flows from the bottom of the primary distillation tower into the total feed accumulator. The overhead from the primary tower passes through heat exchangers and then into the secondary distillation tower, where it is separated into light and heavy naphtha.

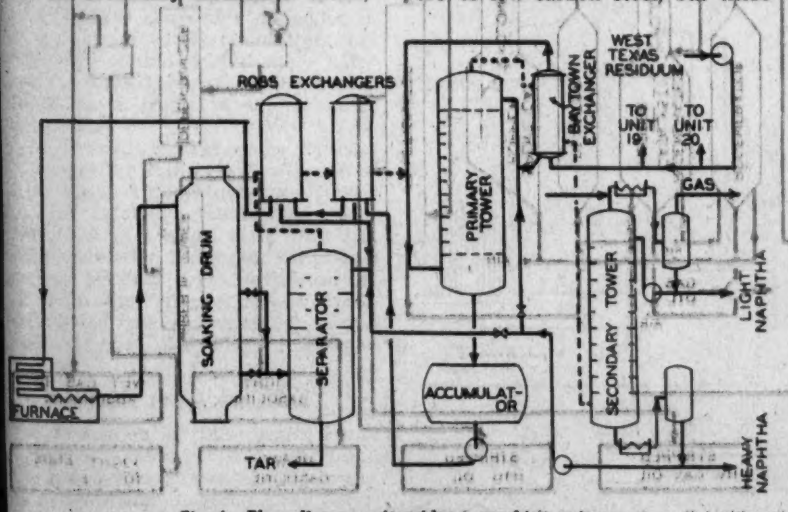


Fig. 1—Flow diagram of residuum cracking unit

1. Furnace tubes.—The first 72 tubes in the convection section of the furnace are low-carbon steel, the next 30 tubes are 4 to 6 per cent chromium steel, and the last 16 tubes in the convection section and the 39 tubes in radiant section are 18-8 alloy.

Originally all tubes in this furnace were of low-carbon steel, but those in the radiant section and the last 16 tubes in the convection section were replaced with 18-8 alloy because of the rapid corrosion experienced. It was later found necessary to replace the next 30 tubes in the convection section with 4 to 6 per cent chromium-steel tubes.

Life of steel tubes in the radiant section of the furnace was as low as 30 days, and the life of the last 16 tubes in the convection section was in the order of 3 months. In general, the performance of 18-8 alloy tubes in this type of cracking operation has been satisfactory. Many of the original tubes are still in service after more than 100,000 hours of operation. During this period some tubes have failed, whereas others have undergone some rather marked changes in their physical properties. It has been found that the tubes possess entirely different physical characteristics. Some are still ductile; others are brittle, but can have ductility restored by heat treatment; whereas others are permanently brittle. On the basis of certain examinations, it has been postulated that the deterioration and, possibly, the failure of the 18-8 alloy tubes are due to structural changes at the grain boundaries. These changes are believed to be progressive in nature, and are dependent upon time, temperature, and stress. It is further postulated that these structrual changes are due to the decomposition of the austenite, which results in the precipitation and growth of highly alloyed ferrite. When these precipitated areas have reached a certain size, cracking occurs under certain conditions with respect to time, temperature, and stress. Once cracking has occurred, the tube is permanently brittle, but at any time prior to the cracking the tube is either ductile or can have ductility restored by proper heat treatment.

2. Hot-oil lines.—In the initial operation of this plant, rather severe corrosion was experienced in all lines through which oil was pumped at a temperature above about 450° to 500° F. To eliminate this type of corrosion, essentially all of the lines downstream from the furnace have been replaced with 18-8 alloy lines. The installation of 18-8 alloy lines in

hot-oil service has essentially eliminated corrosion in this service.

3. Soaking drums.—The soaking drum is of low-carbon steel. Temperature conditions are such in this drum that rapid corrosion would occur if the drum were not protected. The drum is protected against corrosion by the application of a reinforced layer of gunite about 3 in. in thickness. This type of protection is very effective in reducing corrosion of the drum, but the coating is frequently damaged in the process of removing the coke from the drum. This necessitates frequent repairing and replacing of the gunite lining. This type of protection is so effective that these drums are in satisfactory operating condition after almost 20 years of service in cracking reduced West Texas crude.

4. Separator.—The separator was originally of all-steel construction. Rapid corrosion was experienced in this piece of equipment, and it was necessary to apply protection to avoid failure of the separator. Protection employed consists of guniting the shell and installing an 18-8 alloy lining in manhole openings, etc. The plates in the separator are of steel, but are being replaced with 4 to 6 per cent chromium steel as they fail. All supports are of 18-8 alloy.

5. Bubble towers.—The bubble towers are of low-carbon steel, and are equipped with steel plates and cast-iron bell caps, except for the three bottom plates in the primary bubble tower. These plates are of 11 to 13 per cent chromium steel, with bell caps of the same material. The shell of the primary tower is protected with a gunite lining.

6. Accumulator.—The accumulator is of all-steel construction, and is protected with a gunite lining.

7. Preheaters.—The exchanger is the primary preheat circuit, and is of all-steel construction. Corrosion is not a problem in this preheater. The exchangers in the secondary preheat circuit are equipped with steel shells and 18-8 alloy tubes. The steel shell is protected by metallizing with aluminum. This protection is satisfactory and, as a result, maintenance costs are low.

8. Neutralizers.—It was found that the injection of caustic, 6 lb. per 1,000 bbl. of crude, into the crude charge to the pipe still resulted in an appreciable reduction in the corrosion of the thermal cracking unit in which the residuum from the pipe still was processed.

Larger quantities of caustic could be tolerated in the pipe still, but any increase in the amount of caustic injected into the charge to the pipe still, i.e., above 6 lb. per 1,000 bbl. of crude, materially affected the service factor on the thermal cracking unit as a result of the rapid rise of metal temperatures in the furnace tubes. It was found, however, that an increase in the caustic injected into the charge to the pipe still effected a corresponding decrease in the corrosion of the cracking equipment.

An experimental study of lime injection into the cracking unit was made to determine whether the corrosion of cracking equipment (occurring while 6 lb. of caustic per 1,000 bbl. of crude was being injected into the charge to the pipe still) could be reduced further by injecting lime ahead of the cracking-unit furnace. It was found that, when 250 lb. of lime per 1,000 bbl. of residuum was injected, the life of the steel tubes in the convection section of the cracking-unit furnace was increased by about 40 per cent, and the over-all loss of iron from the unit was decreased by 20 to 30 per cent. The injection of lime was never put into practice, because the increase in the sediment content of the fuel from the cracking operation was more than could be tolerated.

Ammonia is injected into the overhead vapor line from the secondary bubble tower to neutralize inorganic and organic acid and, thus, reduce the corrosion of the overhead vapor line and condensors as well as other equipment downstream from the cracking unit.

Fluid Catalyst Cracking Unit

Corrosion, as such, is not a problem of any particular significance in the operation of fluid catalyst cracking units. Some difficulty is experienced as a result of erosion of certain portions of the equipment, but serious corrosion has not been experienced in one case. This corrosion occurred in the 18-8 alloy vapor lines leading to and from the reactor on an up-flow unit, and was intergranular in nature.

A simplified flow diagram of this type of unit is shown in Fig. 2. The vapor lines in which this stress-corrosion cracking occurred were lined at points of turbulence with carbon-steel wear plates to absorb erosion caused by the catalyst. The intergranular cracks that occurred in these vapor lines were located behind the carbon-steel wear plates. The extent of this type of corrosion was such that it made the unit essentially inoperable.

In the investigation of this corro-

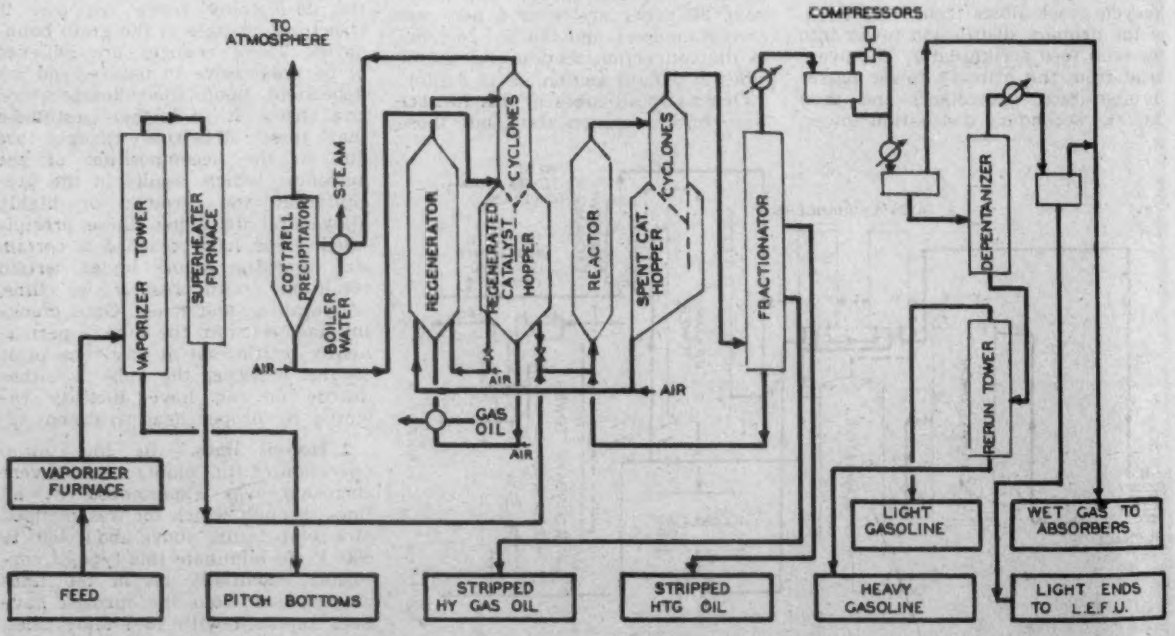


Fig. 2—Simplified flow diagram of fluid catalyst cracking unit

sion problem, it developed that there was a small annular space between the wear plates and the 18-8 alloy vapor lines. Catalyst and hydrocarbon vapors circulated at low velocity in this small annular space when the unit was on stream. During this time, the carbon steel wear plates were corroded rather rapidly by hydrogen sulfide at the operating temperature of about 950° F. As the velocities in the annular space between the wear plates and the 18-8 alloy vapor lines were low, a relatively thick scale of iron sulfide was formed on the carbon-steel wear plate.

It is well known that 18-8 alloy loses some of its resistance to corrosion when heated for appreciable lengths of time at temperatures of 950° to 1,400° F. This loss in resistance to corrosion is attributed to the precipitation of chromium carbide along the grain boundaries. This leaves the metal adjacent to the grain boundaries low in chromium content and, as a result, susceptible to corrosion when placed in the proper environment. When the environment is an acid solution of relatively low concentration, the attack is usually concentrated at the grain boundaries, and failure occurs as a result of intergranular corrosion, or stress- corrosion cracking.

In this particular case, it was postulated that, during the operation of the unit, beds of catalyst collected in the annular space between the wear plates and the 18-8 alloy vapor line. During the turnarounds, when the unit was steamed free of hydrocarbons, the beds of catalyst between the wear plates and the 18-8 alloy vapor lines were wetted with water. After the unit had been opened, air was present for the oxidation of the iron sulfide to sulfate. These salts hydrolyzed, forming sulfurous and sulfuric acids which attacked the 18-8 alloy—resulting in failure of the metal along the grain boundaries. In an attempt to duplicate this type of corrosion, stressed specimens of susceptible 18-8 alloy were imbedded in a mixture of catalyst and iron sulfide and wetted with water. After several days, the stressed 18-8 alloy failed as a result of intergranular corrosion.

As a result of this work, the carbon-steel wear plates were removed from all 18-8 alloy tubes and vessels in the catalyst system, and wear plates of 18-8 alloy were installed. This eliminated the formation of iron sulfide between the wear plates and the 18-8 alloy lines and, as a result, eliminated the intergranular corrosion of the 18-8 alloy lines and vessels.

Vapor-Phase Cracking

This section of this paper is not concerned directly with corrosion experienced in processing sour crude. This discussion is included, however, to emphasize that all corrosion experienced in cracking operations at elevated temperatures is not necessarily due to sulfur or its compounds. It is shown in the discussion that follows that there are cases in which appreciable quantities of sulfur are extremely effective in reducing corrosion of 18-8 alloy furnace tubes in high-temperature cracking service.

During the recent war the true-vapor-phase process was employed in reforming 200° to 400°F.-boiling-range naphtha at a temperature of 1,310° to 1,325° F. for the production of butadiene. A flow diagram of the true-vapor phase process as it was employed in the production of butadiene is shown in Fig. 3. Three plants of this type were constructed and put into operation.

In the initial operation of one of these plants, a peculiar and acute type of corrosion was experienced which resulted in the failure of the 304-type 18-8 alloy tubes in the naphtha circuit of the superheater furnace after only 120 hours of operation. Similar corrosion was experienced at the other two plants. One of these plants continued in operation, but the other was converted into a unit for the production of gasoline after several months of intermittent operation during which attempts to develope methods of suppressing the corrosion were unsuccessful. It is believed that the type and degree of corrosion experienced at these plants are without parallel.

In the initial stage of reforming sweet naphtha from Refugio crude at one of these plants, the unit was rendered inoperable because of the rapid corrosion of the 18-8 alloy furnace tubes in the naphtha circuit. An investigation of the corrosion experienced at this plant was undertaken at the request of the Petroleum Administration for War. Examination of a number of furnace tubes indicated that the failures were due primarily to uniform thinning of the tube wall. However, severe pitting did occur, particularly in the tubes near the inlets to the superheaters, and in new tubes in the outlet passes when they were first put into operation.

The new tubes were 2 in. in diameter, with a wall thickness of 0.156 in. One side of the tubes was severely pitted, whereas the other was only slightly attacked. The corrosion was limited primarily to the center sections of the tubes, and was more severe on the side (internal surface) next to the furnace. The end sections and return bends were relatively free of corrosion. This indicates that metal temperature was an important factor in the corrosion.

Early in this investigation, extensive analytical data were obtained on the naphtha charge and the recycle streams to the furnace, but none of these results gave any indication of the cause of the corrosion.

Inasmuch as it was not possible to determine the cause of the corrosion experienced at this plant by analyzing the charge stocks and recycle streams, bench-scale laboratory studies were conducted (under conditions approximating those existing in the plant) for the purpose of developing the most feasible method of minimizing the corrosion.

Equipment employed in the laboratory investigation is shown in Fig. 4. The various naphthas were cracked in a quartz tube (0.875-in. inside diameter) at essentially atmospheric pressure, and at temperatures comparable to those employed in plant practice. A naphtha charge rate of 200 ml. per hour was used in these

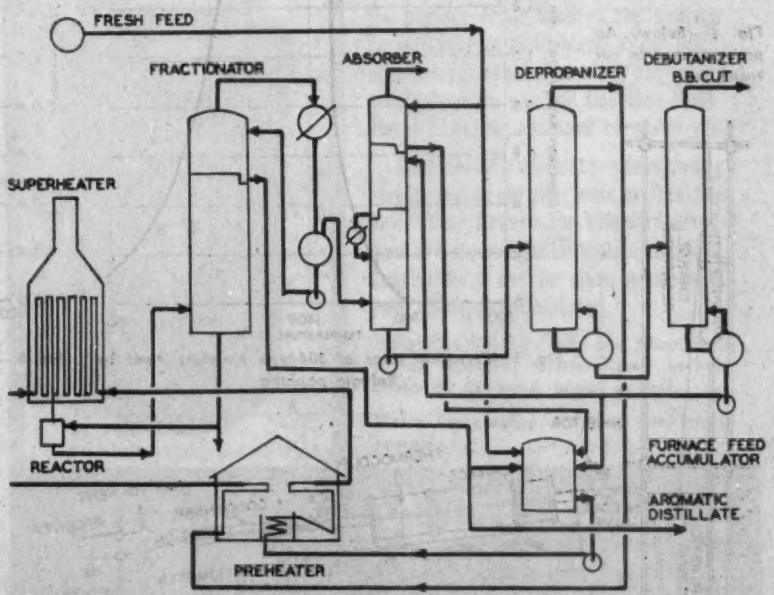


Fig. 3—Flow diagram of true-vapor-phase butadiene plant

tests. The temperatures were measured with a thermocouple placed against the outside of the quartz tube in the center of the end section of the furnace. Three 18-8 alloy test specimens (cut from a furnace tube from the butadiene plant) were placed end to end in the quartz tube at the center of the outlet section of the furnace. The location of the metal test specimens is shown in Fig. 4. The test periods varied in length, but most of the runs were in progress for 20 hours. The corrosion rates were calculated by the conventional weight-loss method.

The results obtained in tests that were made for the purpose of reproducing the corrosion experienced at this plant are shown in Fig. 5. These results indicate that sweet naphtha from Refugio crude is extremely corrosive to 18-8 alloy under the conditions of the laboratory tests; however, the corrosion rates obtained in the laboratory are not so high as those experienced in the plant. This difference is probably a function of the velocities employed. The velocity of the naphtha vapors in the laboratory tests was extremely low, whereas high velocities (approximately 200 ft. per second) were employed in plant operation. Maximum corrosion rates occurred at 1,400° to 1,450° F. Less corrosion was obtained at higher and lower temperatures. It is not known whether there is a reduction in the tendency for the naphtha to corrode at the higher temperatures, or whether the deposition of coke at these temperatures is such that the metals are shielded from corrosion.

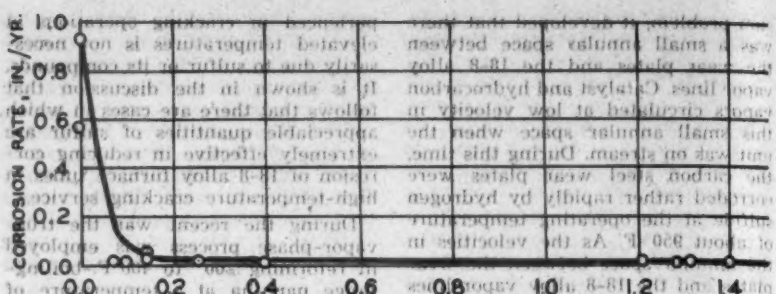


Fig. 7—Effect of distilled water on corrosion of 304-type stainless steel by Refugio naphtha at 1,485° F.

A series of laboratory tests was made to determine the effect of various sulfur compounds on the tendency of Refugio naphtha to corrode 18-8 alloy in the temperature range of 1,300 to 1,500° F. The results of the tests in which free sulfur was added to the naphtha are shown in Fig. 6. Results obtained using similar concentrations of sulfur as butyl mercaptan and carbon disulfide were comparable to those obtained with free sulfur. The addition of 0.05 to 0.5 per cent by weight of sulfur (as free sulfur, butyl mercaptan, or carbon mercaptan, or carbon disulfide) to the naptha essentially eliminates its tendency to corrode 18-8 alloy. It is indicated that lower amounts of sulfur effect marked reductions in the corrosion, but more uniformly consistent results were obtained on adding 0.05 per cent by weight, and higher, of sulfur. It was observed also that the addition of sulfur essentially eliminated coke deposition on the 18-8 alloy. Both of these observations have been confirmed by the results obtained in plant operation.

The effect of the addition of small amounts of distilled water on the tendency of the naphtha to corrode 18-8 alloy under cracking conditions is shown in Fig. 7. These data indicate that the corrosion can be eliminated by adding 0.06 to 0.04 per cent by weight of water to the naphtha. Larger amounts of water are not detrimental, but are unnecessary. It was observed that the addition of water also effected a marked reduction in the tendency of the naphtha to coke 18-8 alloy under the test

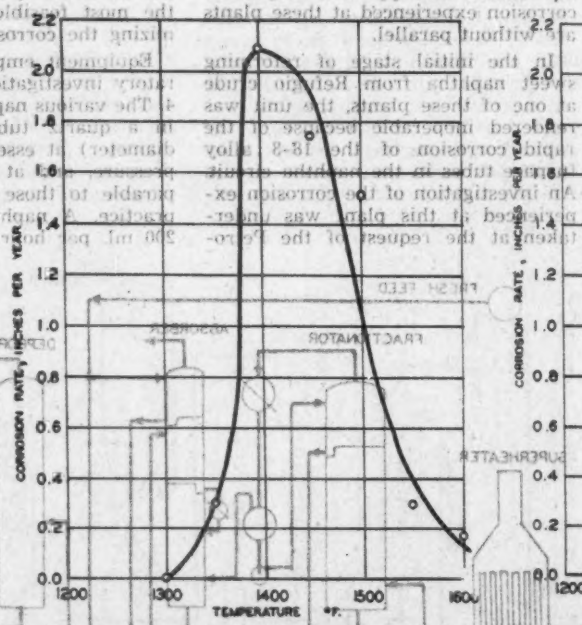


Fig. 5—Corrosion rates of 304-type stainless steel by Refugio naphtha

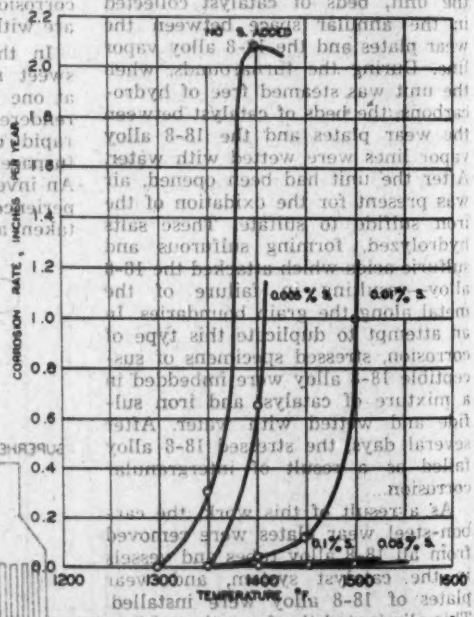
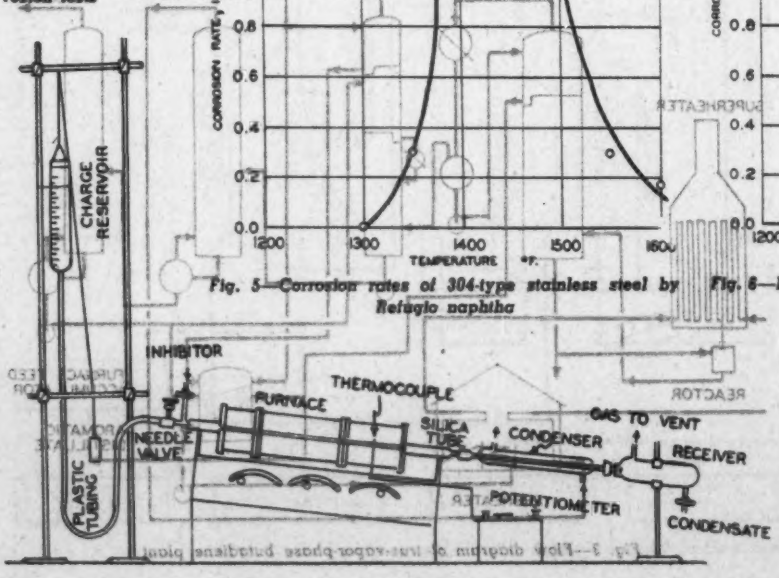


Fig. 6—Effect of sulfur on corrosion of 304-type stainless steel by Refugio naphtha

Fig. 4—(Below) Apparatus used in corrosion tests



conditions employed. No plant experience is available to substantiate these results.

Further tests in the equipment previously described indicated that carbon dioxide, ethyl alcohol, acetic acid, hydrogen sulfide, and sulfur dioxide are satisfactory inhibitors for controlling the type of corrosion experienced at this butadiene plant. The optimum quantities of these materials required to maintain corrosion and coke deposition at a minimum were not established, because sulfur and water had been found to be adequate for this purpose.

Exploratory Tests Made

Several exploratory corrosion tests were made in attempts to establish the cause of corrosion. However, none of these tests gave an indication as to the causative agent. It was shown that the removal of active sulfur compounds, peroxides, chlorides, and inorganic salts (by refluxing with molten metallic sodium followed by washing with distilled water and filtering) effected no reduction in the tendency of the naphtha to corrode 18-8 alloy. The addition of such compounds as benzoyl peroxide, magnesium chloride, acetylene, isobutylene, normal butane, butadiene, furfural, aniline, etc., to a noncorrosive naphtha (normal hexane) failed to induce corrosion under the cracking conditions employed. Various types of essentially pure hydrocarbons, such as paraffins, aromatics, naphthenes, and unsaturates, were found to be noncorrosive.

Results of corrosion tests in which oxygen was excluded from the naphtha from Refugio crude indicate that dissolved oxygen is not a significant factor in the corrosion experienced at this butadiene plant.

To evaluate the possible effect of charge stock on the corrosion of the 18-8 alloy furnace tubes, a trial run was made at this plant employing a highly paraffinic naphtha (normal hexane) as fresh feed. This run was in progress for approximately 700 hours without any evidence of corrosion of the superheater furnace tubes. Samples of various naphtha streams were taken for analytical examination during this run. The results obtained on analyzing these samples were not materially different from those obtained on comparable samples when processing Refugio naphtha, and are not conclusive as to the cause of the corrosion when processing Refugio naphtha or to the lack of corrosion when charging normal hexane.

When the trial run on normal hexane was terminated, a run was made on freshly distilled gas-blanketed Refugio naphtha to which sufficient butyl mercaptan had been added to maintain 0.005 to 0.006 per cent by weight of sulfur (as butyl mercaptan) in the furnace charge. This run was terminated after 618 hours because of the failure of an outlet tube in a naphtha pass. The results obtained on inspecting the furnace tubes were not so discouraging as the short length of the run indicated. The seventh and eighth tubes were severely attacked, whereas only incipient corrosion had occurred on the sixth tube. In previous runs that were terminated in about the same length of time because of tube failures, it was found that the fifth, sixth, seventh, and eighth tubes were corroded to about the same extent with only 0.01 in. to 0.02 in. of the original 0.516-in. wall thickness remaining.

Because of the results obtained in the first run employing sulfur as an inhibitor, and because the laboratory results indicated that sulfur in concentrations up to 0.5 per cent by weight was beneficial rather than harmful to the 18-8 alloy, a second run was made employing a minimum of 0.05 per cent of added sulfur based on the furnace charge. An inspection of the furnace tubes after 135 hours of operation showed that no corrosion had occurred in any of the tubes. As a result of this successful run, operation of the unit was continued. Carbon disulfide was injected in a quantity sufficient to maintain approximately 0.3 per cent by weight of sulfur (as carbon disulfide) in the furnace feed. The unit was in operation over 10,000 hours without any evidence of corrosion in the naphtha tubes of the superheater furnace. After 2,764 hours of operation with sulfur injection, a failure occurred in one of the outlet tubes of the recycle-gas circuit. On inspection, the failure was found to be due to pitting at random in the gas tube. Only one other outlet gas tube was found to be pitted sufficiently to require replacement. None of the other tubes in the recycle-gas circuit was attacked. For several weeks prior to the failure of the gas tube, the concentration of hydrogen sulfide in the recycle-gas stream was subject to considerable variation. A large quantity of absorber overhead gas has been used for recycle gas, which resulted in a substantially lower concentration of hydrogen sulfide in the recycle-gas stream. It is thought that this lower hydrogen sulfide content was a contributing factor in the corrosion of the gas tubes.

The addition of sulfur to the furnace feed essentially eliminated coke deposition in the furnace tubes. With added sulfur in the charge, only a very thin, hard scale formed on the inside of the tubes. Analysis of this scale showed it to be essentially carbon.

References

1. Camp, Phillips, and Gross, Corrosion 1 (2) (1945).
2. U. S. Patent 2,043,274.

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(Continued from page 69)

making the total cost of the cellar and conductor hole, exclusive of pipe and cement, about $255. The conductor pipe is set with the unit as a part of the job. However, cementing of the pipe and the walls and floor of the cellar is done by the operator. Premixed cement, containing sand gravel, is used. From 3 to 4 cu. yd. of cement usually are required for the job, and at the prevailing price of $18 per yard, the cement cost ranges from $54 to $72. This makes a total cost for the cellar and conductor hole, exclusive of the pipe but including the cementing, of from $309 to $327, as compared with $544, exclusive of the pipe and pipe cement, when the conductor hole is drilled with the big rig.

Under the new procedure, cementing of the conductor pipe and the cellar is done in one operation. For the cellar walls, a circular metal form is provided. The cement first is poured behind the conductor pipe to fill the annulus and then is spread over the cellar floor to the desired thickness, after which the space behind the cellar wall form is filled to complete the job.

Digging the rat and mouse holes and the guy-line anchor holes is extra and is charged for at the $5-per-foot rate. Formerly, the drilling rig drilled its own rat and mouse holes and were charged by the contractor to his rig time, and no direct comparisons of costs can be made. In this case, the contractor receives the direct benefit in rig-time savings made, which are indirectly passed on to the operator through reductions in contract rates, or through deductions for the cost of these holes.

Having the conductor pipe set and cemented, and rat and mouse holes drilled in advance of moving on the drilling rig, saves the rig at least 3 days' time on each well, including 1 day it would have to be shut down waiting on cement to set. Rig time at Rangely, based on charges made for any day work, is figured at approximately $650 per day. Consequently, the 3 days saved represents an indirect saving in rig time to the contractor at approximately $1,950 per well.

Normally, the small drill can complete a location, including the setting of the conductor pipe, within from 4 to 5 hours. At this rate, the one unit now working in the field is easily able to keep at least one rig. Currently, there are more than 45 rigs in the field but since wells require from 45 to 55 days, frequently longer, to drill, the average need for a location is less than one per day.

The unit is owned and operated by McMullen Construction Co. All equipment, including a light, folding mast, is mounted and carried on a single, medium-weight truck except for an auxiliary endless-conveyor-belt unit, which is towed by the truck or car as a two-wheeled trailer. On location, it can be ready to drill within a matter of a few minutes, requiring only the raising of the mast and placing of the conveyor-belt unit, the latter being used for moving the cuttings taken from the hole to a convenient distance from the work. Only two men are needed to operate it.

The drill itself is little more than a mechanized, large-sized, bucket-type post-hole digger. The "bucket" for hoisting the cuttings from the hole consists of an open-top steel cylinder about 3 ft. long with an outer diameter the size of the hole being dug. Radial cutting blades on the bottom scoop up the cuttings and deflect them into the bucket while rotating. The bucket is run on a short small-sized square kelly joint suspended by the hoisting line in the mast. It is rotated by means of a gasoline-engine-driven turntable on the back end of the truck. The same engine operates the bucket hoist. When the depth of the hole exceeds the feeding length of the kelly, additional short sections of pipe are made up between the kelly and the bucket to increase the length of the drill string. The kelly alone insures sufficient weight on the bucket and blades to cut the hole. When the bucket fills it is hoisted to the surface and accumulated cuttings are dumped into a receiving box which feeds them onto the endless belt conveyor for removal to the refuse pile. The belt is driven by a small, independent gasoline engine.

A cellar usually is started with a 36-in. diameter hole dug to a depth slightly below the desired bottom depth of the cellar. Then, by means of cutting-blade extensions bolted to the bottom of the 36-in. bucket, the hole is reamed in two stages, first to a diameter of approximately 60 in. (5 ft.) and finally to 84 in. (7 ft.). The extension blades consist of flat steel bars, 4 to 6-in. wide, with cutting edges. Ends are turned up at right angles to cut the walls of the cellar. The blades extend slightly upward from the bucket to the wall being cut and are so deflected that cuttings are pushed to the center of the hole where they are scooped up into the bucket. After completing the cellar, the 36-in. bucket and extension blade arms are replaced with the 20-in. bucket and blades for the conductor hole.

Rat and mouse holes necessarily must be sloped from vertical. This is accomplished by lowering one side of the truck so that the unit sets at the desired angle. It generally is done simply by digging out holes for the wheels of the truck to rest in.

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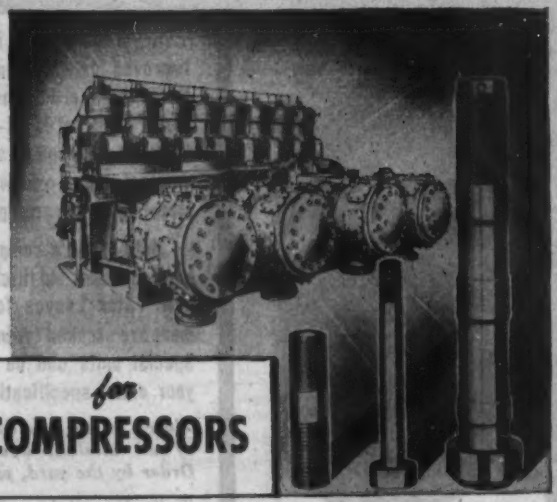

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QUESTIONS on TECHNOLOGY

by W. L. Nelson

Consulting Engineer

Pressure Drop in Stills

Note:—Questions arose in 1944 and in 1946 (August 31) regarding the pressure drop through pipe stills. It is so important that partial answers were given on March 30, 1944, August 31, 1946, and July 5, 1947, and now a further answer can be given.

The pipe still considered in the three analyses (August 31, 1946, July 5, 1947, and now) is one which discharges into an atmospheric-type fractionating system. The following conditions were adopted:

Charge rate, bbl per day	2,000
Tube size—I.d., in.	3
Tube length—ft.	15
Tube length—equivalent ft.	30
Transfer line, ft.	70
Transfer line, equivalent ft.	100
Inlet temperature, °F.	400
Stock, A.P.I. (mixed base)	37
Stock, mid boiling-point, °F.	600
Tower pressure, psig.	6
Radiant absorption rate (on projected tube area), B.t.u.	25,000
Efficiency, per cent	77
Velocity, based on 60° F., ft./sec.	1.87

Three cases in which slope of the feedstock is the major variable, have been studied:

	Slope, deg./%
August 31, 1946	9.4
July 5, 1947	7.0
Present	4.0

The present case, and the curves shown here, are for a slope of 4.0, which would apply generally to narrow-boiling-range stocks, such as reboiler oils, naphthas, gas oils, etc. Fig. 1 shows pressure drop, Fig. 2 shows temperature, and Fig. 3 shows per cent vaporization, all versus equivalent length. Some steam was used in the fractionating tower and hence, considerable vaporization takes place between the end of the transfer line and the tower proper (see Fig. 3) as the stream is exposed to the steam (and reduced partial pressure) in the tower. In a sense, this means that the effective pressure in the tower is less than 6 psig. (20.6 psia.) but even with the smallest amount vaporized (30 per cent), the effective pressure only drops to 11.2 psia.

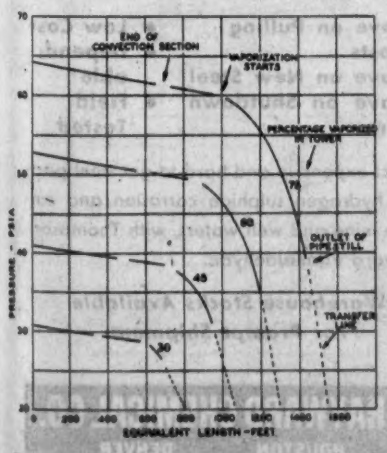

Fig. 1—Pressure drop in pipe stills—2,000 bbl. per day of a stock of slope 4.0 in 3-in. I.d. tubes

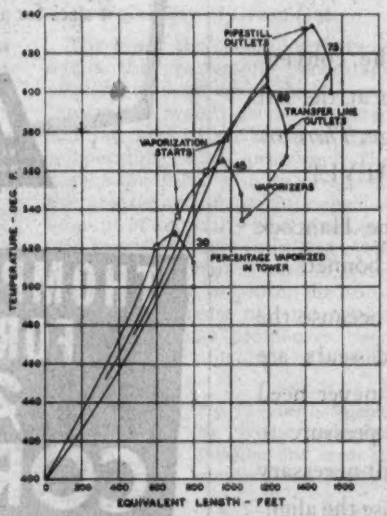

Fig. 2—Temperature rise in pipe stills—2,000 bbl. per day for a stock of slope 4.0 in 3-in. I.d. tubes

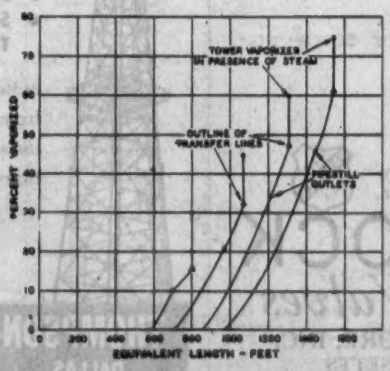

Fig. 3—Per cent vaporized in pipe stills—2,000 bbl. per day of a stock of slope 4.0 in 3-in. I.d. tubes

References to Piping-System Design

Has your company published anything on the subject of calculating stresses in multiplane (three dimensions) pipe systems, as used mostly in refinery installations?—F. U.

Little has been published about the design and stresses of pipe systems. The loose-leaf booklet of M. W. Kellogg Co., entitled, "Design of Piping Systems," (Reference No. 8) is one of the most complete discussions.

Recently an excellent series of articles entitled, "Methods of Making Piping Flexibility Analyses" has been appearing in Heating, Piping, and Air Conditioning. Authorities throughout the United States and even Europe have contributed as follows:

Crocker and McCutchan, Area Moment Method, June 1946.

Spielvogel, S. W., Elastic Center Method, July 1946, p. 78.

Fish, M. J., Graphical Method, September 1946, p. 83.

Hooper, W. G., Tabular Integration Method, November 1946, p. 70.

DeHart, R. C., Moment Distribution Method, January 1947.

Wallstrom, H. V., General Analytical Method, May 1947.

Andrews, L. C., The Model Test Method, August 1947, p. 73.

Carlier, H., General, September 1947, p. 86.

Some other important references are:

1. Arnold, M. L., Vibration in Compressor-Plant Piping, Pet. Refiner, February 1945, p. 103.

2. Cibulka, A., Fundamentals of Refinery Piping, 4 parts, Ref. Nat. Gaso. Mfr., January, p. 69; February p. 73; March p. 72; and April p. 79, 1942.

3. Crane Co., Catalog No. 41 and its supplements, page 638.

4. Crane Co., Engineering Data on Pipe and Pipe Bends, 1933.

5. Crocker, S., Bending of Curved Pipes, Heating, Piping and Air-Conditioning, May 1931.

6. Hovgoard, W., Stresses in Three-Dimensional Pipe Bends, Trans. A.S.M.E. 57, 401, October 1935.

7. Hooper, W. G., Selection of Pipe Bends Simplified, Heating, Piping and Air-Conditioning, Vol. IV, No. 10, October 1932.

8. Kellogg Co., Design of Piping Systems, M. W. Kellogg Co., 225 Broadway, New York.

9. Mayrose, H. E., Data Sheets for Design of Piping, J. App. Mechanics, 4, June 1937.

10. Poritsky and Snively, Stresses and Deflections of Three-Dimensional Pipe Bends, J. App. Mechanics, 7, March 1940.

11. Rossheim and Markl, The Significance and . . . Limits for Stresses in Pipe Lines . . ., Trans. A.S.M.E. 62, July 1940.

12. Spielvogel and Kameros, Application of the Elastic-Point Theory to Piping . . ., Trans. A.S.M.E. 57, 165, May 1935.

13. Spielvogel and Kameros, A Simplified Method for Solving Piping Problems, Heating, Piping and Air Conditioning, September and October 1935.

14. Stothart, E. W., Importance of Flexible Pipe Supports, Pet. Processing, July 1947, p. 529.

15. Thiel, B. C., Plant Design of Compressor Piping, Pet. Refiner, July 1945, p. 103.

16. Walker and Crocker, "Piping Handbook," McGraw-Hill Book Co., Inc., 1931.

17. Wert and Smith, Pittsburgh Piping Design Manual, Pittsburgh Piping & Equipment Co., September 1935.

18. Wert & Smith, Flex-Anal Charts, Blaw-Knox Co., Power Piping Division, Pittsburgh.

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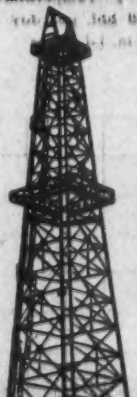

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ENGINEERING *fundamentals*

Estimation of Solution Gas

AMOUNT, of gas in solution in reservoir oil is not always a known measured quantity and an estimate may be necessary to pursue engineering calculations. Accurate estimates of this quantity can be made because sufficient data have been taken on reservoir oils throughout the petroleum industry to enable correlations to be drawn. The amount of solution gas can be estimated within reasonable limits, over a wide range of pressures, temperatures, and fluid characteristics. The simplest estimate is made from a knowledge of only the A.P.I. gravity of the stock-tank oil. The most accurate estimation would require a knowledge of gas composition and liquid composition, temperature, and pressure.

An analysis of the phase behavior of liquids and gases leads to the consideration of the following variables in predicting solution gas: (1) the composition of the liquid phase, (2) the composition of the gaseous phase, (3) the temperature, and (4) the pressure. Since both the liquid and gaseous phases are made up of members of a homologous series, a regular change of gas solubility with molecular complexity would be expected. The simplest manner of characterizing the composition of the liquid and gas is by specific gravity for the gas and by A.P.I. gravity for the oil.

Solubility of Given Gas

The lower the specific gravity of a gas, the greater the percentage of light components indicated and the smaller would be the expected solution in a given oil at a given temperature and pressure. The higher the A.P.I. gravity of an oil, the greater would be the expected amount of solubility of a given gas at a specific temperature and pressure. For a given oil and a given gas at a given pressure, the solubility will decrease as temperature increases. It has previously been noted that the amount of gas solubility increases almost directly with pressure, other things being constant.

The above considerations on the effect of the four variables are qualitative. The quantitative magnitude of the changes can be found only by making specific correlations. A direct correlation of the amount of gas in solution as a function of pressure and A.P.I. gravity of the stock-tank oil involved, but neglecting variations with temperature and gas specific gravity was first made by Katz,[1] and later extended by Beal.[2]

Fig. 1 is a duplication of the chart presented by Beal for estimating gas in solution. The use of this chart is obvious. For using this chart to construct a specific curve for gas solubility versus pressure, A.P.I. gravity of stock-tank oil is the only information necessary. In its use, one cannot differentiate between two instances in which reservoir temperature differs.

A more extensive correlation of gas solubility against pressure, using gas gravity, A.P.I. gravity of oil, and reservoir temperature has been made by Standing.[3] From his correlation, the decrease of gas solubility with temperature rise, all other things being constant, is of the order of 2 per cent per 1° F.

For example, Fig. 2 is obtained by a replotting of data from Standing's general set of curves, and shows the effect of pressure upon gas in solution at three temperatures for a 0.70 specific gravity gas in a 40° A.P.I. oil.

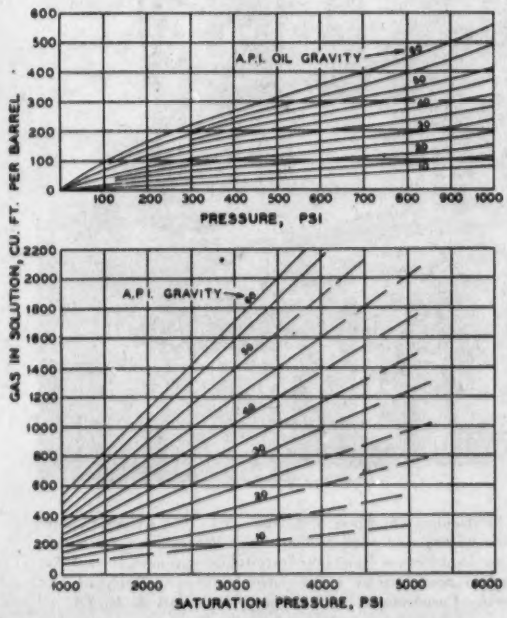
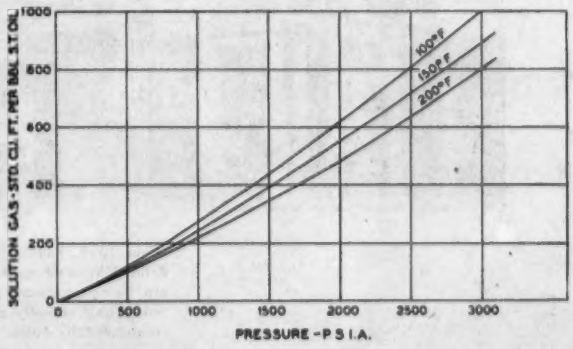


Fig. 1—(Left) Solubility versus saturation pressure and crude-oil gravity (From Beal[2])

Fig. 2—(Below) Effect of temperature on gas in solution



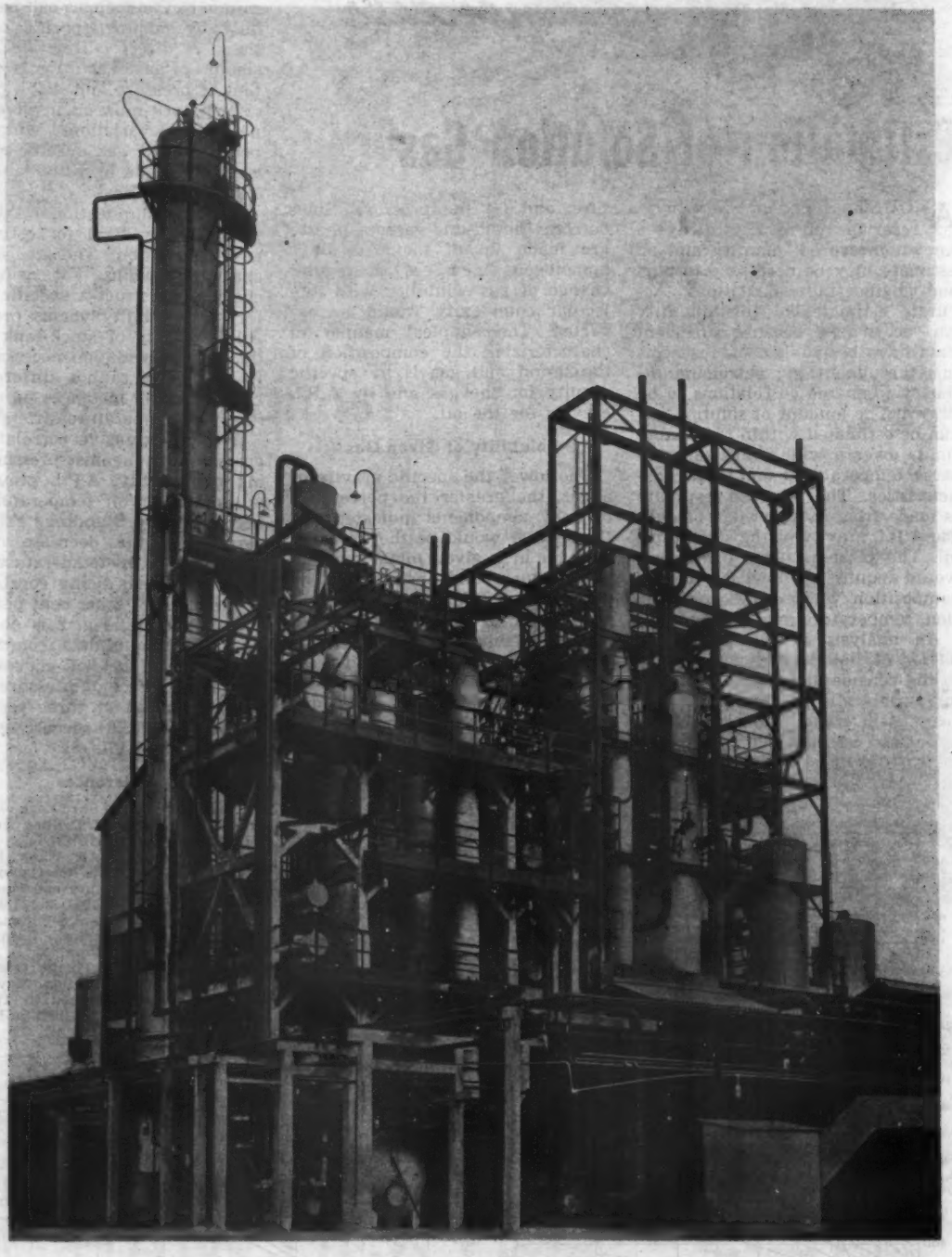
References

1. Prediction of the Shrinkage of Crude Oils, D. L. Katz, A.P.I. Drilling and Production Practice (1942) 137-147.

2. The Viscosity of Air, Water, Natural Gas, Crude Oil, and Its Associated Gases at Oil-Field Temperature and Pressures, Beal, A.I.M.E. Trans, 1946, Vol. 165.

3. A General Pressure-Volume-Temperature Correlation for Mixtures of California Oils and Gases, M. B. Standing. Presented A.P.I. Pacific Coast district, Division of Production, May 15-16, 1947. Paper also published in The Oil and Gas Journal, May 17, 1947, p. 98.

Series prepared by Dr. John C. Calhoun, Jr., Petroleum Engineering School, University of Oklahoma



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The Refiner's Notebook

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

4—Pipe and Tubing Sizes

(5½ Through 6 Inches)

Nominal pipe size (in.)	Steel pipe: Schedule or name	Steel pipe: O.D. (in.)	Steel pipe: I.D. (in.)	Pipe still tubes: O.D. (in.)	Pipe still tubes: Thickness (in.)	Line pipe: O.D. (in.)	Line pipe: Thickness (in.)	Casing: O.D. (in.)	Casing: I.D. (in.)	Cast iron, pit cast: O.D. (in.)	Cast iron, pit cast: Grade	Cast iron, pit cast: I.D. (in.)
5½	...	....	....	5½	1/16	5½	0.154	5½	5.192	...	...	...
	...	....	....	5½	¼	5½	0.165	5½	5.012	...	...	...
	...	....	....	5½	1/8	5½	0.1875	5½	4.892	...	...	...
	...	....	....	5½	⅜	5½	0.228	5½	4.778	...	...	...
	...	....	....	5½	7/16	5½	0.250	5½	5.044	...	...	...
	...	....	....	5½	½	5½	0.304	5½	4.974	...	...	...
	...	....	....	5½	9/16	5½	0.3125	5½	4.950	...	...	...
	...	....	....	5½	¾	5½	0.361	5½	4.670	...	...	...
	...	....	....	...	...	....	....	5½	4.580	...	...	...
5¾	...	....	....	5¾	5/32	...	...	5¾	5.29	...	...	...
	...	....	....	5¾	3/16	...	...	5¾	5.19	...	...	...
	...	....	....	5¾	7/32	...	...	5¾	5.09	...	...	...
	...	....	....	5¾	1.0	...	...	5¾	4.99	...	...	...
	...	....	....	...	...	...	....	5¾	4.89	...	...	...
5 9/16	...	....	....	...	...	5 9/16	0.148	...	...	...	...	...
	...	....	....	...	...	5 5/16	0.1562	...	...	...	...	...
	...	....	....	...	...	5 3/16	0.165	...	...	...	...	...
	...	....	....	...	...	5 1/16	0.1875	...	...	...	...	...
	...	....	....	...	...	5 1/16	0.250	...	...	...	...	...
	...	....	....	...	...	5 1/16	0.258	...	...	...	...	...
	...	....	....	...	...	5 1/16	0.293	...	...	...	...	...
	...	....	....	...	...	5 1/16	0.304	...	...	...	...	...
	...	....	....	...	...	5 1/16	0.3125	...	...	...	...	...
	...	....	....	...	...	5 1/16	0.375	...	...	...	...	...
6	40 standard	6.625	6.065	6	0.120	6	0.1562	6	5.672	6.90	1	6.04
	80 extra strong	6.625	5.761	6	0.134	6	0.164	6	5.620	6.90	2	5.98
	120	6.625	5.501	6	3/16	6	0.165	6	5.552	6.90	3	5.90
	160	6.625	5.189	6	¼	6	0.180	6	5.524	7.10	4	6.02
	dbl. ex. strong	6.625	4.897	6	⅜	6	0.1875	6	5.50	7.10	5	5.94
	...	...	...	6	7/16	6	0.190	6	5.45	7.22	6	5.96
	...	...	...	6	½	6	0.203	6	5.424	7.38	7	6.02
	...	....	....	6	9/16	6	0.2187	6	5.352	7.38	8	5.92
	...	...	...	6	5/8	6	0.220	6	5.24	...	...	...
	...	...	...	6	¾	6	0.224	6	5.14	...	...	...
	...	....	....	6	7/8	6	0.238	...	...	...	...	...
	...	...	...	6	1.0	6	0.250	...	...	...	...	...
	...	....	....	6	1½	6	0.259	...	...	...	...	...
	...	...	...	...	...	6	0.275	...	...	...	...	...
	...	...	...	...	...	6	0.324	...	...	...	...	...
	...	....	....	...	...	6	0.359	...	...	...	...	...
6¼	...	...	...	6¼	¼	...	...	...	...	...	...	...
	...	...	...	6¼	3/8	...	...	...	...	...	...	...
	...	....	....	6¼	½	...	...	...	...	...	...	...
	...	....	....	6¼	5/8	...	...	...	...	...	...	...
	...	...	...	6¼	¾	...	...	...	...	...	...	...
	...	...	...	6¼	1.0	...	...	...	...	...	...	...

Refer to The Refiner's Notebook No. 173 for specifications and references. Pipe still tubes are also available in increments of 1/8 in. o.d., but not usually in as many thicknesses as shown for the 6-in. o.d. tubes above.

See also The Refiner's Notebook No. 168 (November 1), No. 169 (November 8), and No. 170 (November 15) for smaller-diameter pipe and tubing.

No. 172 in a series by W. L. Nelson, professor of petroleum refinery engineering, University of Tulsa

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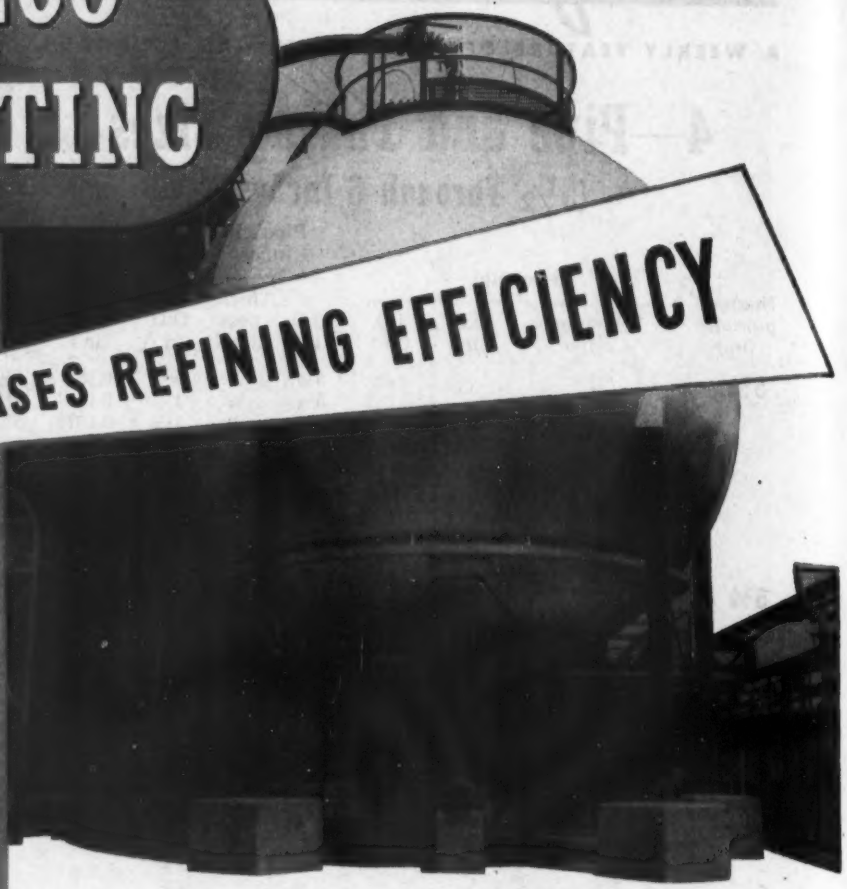

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SALT PLUGGING	is eliminated.
CORROSION	is greatly reduced.
COKING	is less severe, permitting temperature increases.
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REFINING

Socony-Vacuum Planning Petrochemical Display

NEW YORK—Organic sulfur, nitrogen chemicals derived from petroleum, desiccants for the dehydration and drying of various types of materials, and numerous other products derived from petroleum and in which petroleum derivatives are used will be displayed by Socony-Vacuum Oil Co., Inc., at the Exposition of Chemical Industries at Grand Central Palace, New York, December 1 to 6.

Included in these products is S/V Sovabead, a chemically inert desiccant in bead form which removes water from liquids and gases. A new wax emulsion which replaces varnish in application on decalcomanias also will be shown.

Thiophene and its derivatives, aromatic ring compounds containing sulfur and petroleum hydrocarbons, along with benzonitrile, a nitrogen-containing aromatic compound highly useful in numerous chemical syntheses, will be shown as products of the company's research activities.

Many of these organic products show promise of becoming important intermediates in resin, dyestuffs, and pharmaceutical chemistry developments.

Steel-Container Output Shows September Drop

Production of steel shipping barrels, drums, and pails for September decreased slightly from the previous month.

September's production of the heavy-type steel barrels and drums amounted to 2,200,000; light-type steel barrels and drums amounted to 754,000; and production of steel packages, kegs, and pails came to 4,700,000.

Of the total 754,000 light barrels and drums for September's production, 509,000 units were for sale and 245,000 units were for use by the manufacturing company or an affiliate.

Processing Penn Grade Oil Subject at Meeting

Davis Read, Universal Oil Products Co., and H. D. Noll and D. M. Luntz, Houdry Process Corp., were principal speakers at a meeting early this week in Oil City, Pa., of the Oil City-Titusville-Franklin group of the Department of Standards and Tests and the Department of Manufacture of the National Petroleum Association.

Read spoke on "Processing Pennsylvania Crudes," while Noll and Luntz presented a paper on "TCC Processing of Pennsylvanian Crude Oil Fractions."

A. P. I. Booklet Combats Shortage of Fuel Oils

In an attempt to conserve critically short stocks of burning oils, the American Petroleum Institute has published a booklet, "How to Save Money on Oil Heating," for distribution in oil-burning areas.

The booklet contains more than 50 suggestions pointing out methods by which home owners may save up to 60 per cent on fuel bills during the coming winter.

Paper Containers for Motor Oils Described

The manufacture of paper motor-oil containers in Germany is described in a report published by the Office of Technical Services of the Department of Commerce.

While some operational practices are of interest, the containers probably could not be produced in the United States on a competitive basis, the report said.

Full-Production Order Given Butadiene Plant

The Beaumont, Tex., $55,000,000 butadiene plant of Neches Butane Products Co. will be back in full operation within 2 months, according to an announcement by Rep. J. M. Combs.

The plant has been operating at half capacity since April. It supplied two synthetic rubber plants with butadiene, of which it has an annual production capacity of 100,000 tons.

Cooperative Installing 5,000-Bbl. Perco Unit

Completion is expected within the next 60 days of a new 5,000-bbl. daily Perco catalytic reforming - catalytic desulfurization unit at the McPherson, Kans., refinery of National Cooperative Refinery Association.

E. J. Mary, general manager, said the new unit, licensed by the Perco

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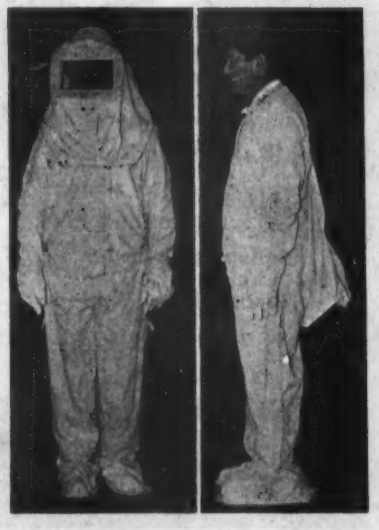

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Division, Phillips Petroleum Co., will process several possible feed stocks, including full-range straightrun and cracked gasolines, and straightrun and cracked naphthas, or mixtures of straightrun and cracked gasolines and straightrun and cracked naphthas. The unit is fully equipped with catalyst regeneration facilities.

Koch Engineering Co., Wichita, contracted for the engineering.

Pasadena Refinery to Be Producing Gasoline Soon

The Pasadena, Calif., 100-octane gasoline refinery purchased by Crown Central Petroleum Co. from War Assets Administration. *(The Oil and Gas Journal, November 22, page 100)* is expected to be producing aviation gasoline again in the near future.

Test runs were scheduled to be conducted this week. The plant, shut down since the last days of the war, has been undergoing reconditoning work for several weeks.

Crown Central purchased the plant for $2,300,000. Appraised fair value of the property was set at $2,796,385.

The properties include 25 buildings. Production facilities include a Thermofor catalytic cracking unit of 10,000 bbl. daily capacity, a 5,000-bbl. treater, and a 3,500-bbl. HF alkylation unit, and a butane isomerization unit, together with auxiliary units.

Refining Dividends Paid In October Show Gain

WASHINGTON.—Publicly reported dividends paid by oil refining corporations in October amounted to $14,500,000, an increase of $1,100,000 over the corresponding month last year, it was reported last week by the Department of Commerce.

Dividends paid by the industry during the 3 months ended with October totaled $82,000,000, which was $18,200,000 better than for the same period in 1946. Only two industries, food and chemicals, showed higher dividend distributions for the 3-month period.

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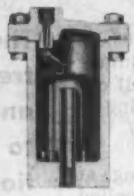
One of a series of advertisements featuring specific applications of Armstrong Traps in the oil field and the refinery

HOW TO GET *DEPENDABLE* CONDENSATE DRAINAGE OF STEAM HEADERS . . .



CROSS SECTION FORGED STEEL TRAP

HOW TO SELECT TRAPS for steam main drainage: The Armstrong Steam Trap Book contains complete data, charts, tables, safety factors, trap capacities, prices. Send for a copy—you'll use it regularly. ARMSTRONG MACHINE WORKS, 868 Maple St., Three Rivers, Michigan.

USE ARMSTRONG FORGED STEEL STEAM TRAPS

Forged steel for safety. Stainless steel mechanism with hardened chrome steel valve and seat for long life. Genuine inverted bucket principle for simplicity, dependability, automatic air discharge, freedom from dirt troubles and air binding. User satisfaction evidenced by standardization on Armstrong in hundreds of plants. A satisfaction or your money back guarantee by the maker. These are the reasons why Armstrong Forged Steel Traps are the wisest choice for steam mains, headers and process equipment. For complete data, ask to have your Armstrong representative call.

IF IT'S A TRAPPING JOB . . .

Steam Traps • Air Traps • Gasoline/Water Traps • Purgers

PIPE LINES

Pipe Laying to Begin on Jal-Cushing Crude Line

LAYING of pipe is scheduled to begin this week on the Midland-Wichita Falls section of the 500-mile crude-oil line between Jal, N. M., and Cushing, Okla.

The 253-mile Midland-Wichita Falls section will be of 22-in. pipe and will be laid by Latex Construction Co. The section is scheduled for completion by May 1, 1948, if pipe is delivered according to schedule.

Job headquarters of the Latex organization will be in Big Spring. E. C. Norris is superintendent; Jim Williamson, assistant superintendent; and Paul Dakin, office manager.

Termed the largest United States crude-oil line to be built with private capital, the project is expected to relieve the critical situation in West Texas, where crude production now is limited by a lack of pipe-line outlets.

It is a joint project undertaken by Texas Pipe Line Co., Shell Pipe Line Corp., Empire Pipe Line Co. and Sinclair Refining Co.

Contract for the Jal-Midland section, about 67 miles of 20-in. line, is expected to be awarded in January. The third section, 173 miles from Wichita Falls to Cushing, will be of 24-in. pipe *(For map and other details, see The Oil and Gas Journal, March 1, page 51).*

Kountz Named Head Of Pipe Liners Club

Clark H. Kountz, vice president of Sinclair Refining Co., has been elected president of the Pipe Liners Club to succeed Capt. W. R. Finney, pipeline advisor to Standard Oil Co. (N.J.) D. D. Irwin, Pure Transportation Co., was reelected vice president, and Oliver C. Klinger, publisher, was reelected secretary-treasurer.

The board of governors includes Kountz, Finney, Irwin, W. C. Kinsolving, president of Sun Pipe Line Co., and D. F. Leary, secretary of Petroleum Advisors, Inc.

Littell Asks Creation Of New Radio Service

Declaring that no satisfactory radio service now exists for petroleum pipe lines that are not public utilities, F. W. Littell, Shell Pipe Line Corp., Houston, has requested the Federal Communications Commission to create a new petroleum radio service covering pipe-line and production stations alike.

Pipe line stations now operate under provisions for a utility radio service, which the FCC rules describes as a radio service used in the "operation of certain public utilities."

Littell suggested that in addition to pipe-line needs, production activities require radio service for drilling

INTERSTATE'S AERIAL PIPE-LINE "WALKER"

Joe Pipkin, chief pilot for Interstate Oil Pipe Line Co., Tulsa, is shown here prior to taking off in one of the company's three planes on a patrol of the company's 3,500 miles of line in Oklahoma, Louisiana, Arkansas, Mississippi, and Missouri. The planes are equipped with message chutes for dropping reports to crews at pump stations. They have special left doors to provide better observation and contain shock-mounted instruments

"Everything for the Pipeliner"

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rigs in remote areas, reliable communication with proven fields, radio facsimilie for transmission of pressure gages and other data, and the automatic transmission of signals from operating wells.

Creation of a production or joint service, he pointed out, would enable pipe-line stations to withdraw from the utility radio service and transfer to the new petroleum-industry service.

Staking of Trans-Arabian Line Nearly Completed

THREE groups of American engineers are rapidly completing preliminary field work along the 1,040-mile route of Trans-Arabian Pipe Line Co.'s Middle East line. B. E. Hull, president, said Tuesday the staking out of the route from Abqaiq oil field in Saudi Arabia to a Mediterranean terminus on the Lebanese coast near Sidon is progressing "according to plan."

A survey party in Saudi Arabia has set location stakes for the first 100 miles of the 30 and 31-in. line, which is scheduled for completion by 1950 and will carry 300,000 bbl. of oil a day.

A central survey party, working eastward from the "angle point" in Iraq Petroleum Co.'s pipe line in Trans-Jordan, has completed final location as far as the Saudi Arabian border. In the rough, broken terrain at the western end of the line, a third party has completed reconnaissance work from the Mediterranean coast across Lebanon and beyond into Syria.

Hull said unloading terminals for construction supplies and equipment are being established at Ras el Misha'ab, on the upper reaches of the Persian Gulf, and at Beirut Harbor, Lebanon

Initial unloading operations, using makeshift facilities, began at Ras el Misha'ab in July. Test piles have been driven for a "sea island," where ships will be unloaded and from which barges will move the cargo to shore. A 15,000 aerial cableway also will be used in ship-shore movement. Foundations and towers for this cableway now are under construction.

A temporary high-tide barge dock, connected with the shore by an 800-ft. earth fill, has been completed. Later it will be replaced by a lighter dock 1,600 ft. offshore.

To assure an adequate water supply along the pipe line's route, two crews are drilling wells and already have completed two.

Temporary offices of Trans-Arabian have been established at Hotel Metropole in Beirut, which has been selected for field administrative headquarters for building the line.

Magnolia Begins Testing Of Beaumont-Hearne Line

Magnolia Pipe Line Co. on November 25 commenced test runs through the new 178-mile, 12-in. Beaumont-Hearne, Tex., products line. After testing the line at 800 psi., the line will continue in regular service for deliveries to Houston and Hearne terminals.

The company had laid 380 miles of 20-in. for the Corsicana, Tex.,-Patoka, Ill., 647-mile crude-oil line. The Red River crossing is complete. Work on the Mississippi and Arkansas River crossings is 75 per cent completed.

Movements by Pipe Line Show 10.2 Per Cent Gain

The volume of crude oil and products transported by pipe lines during the third quarter of this year showed an increase of 10.2 per cent over the same period in 1946.

Figures compiled by the Interstate Commerce Commission from reports of 44 pipe-line companies whose operating revenues exceed $500,000, showed that Humble Pipe Line Co. handled the largest volume during the period, moving 72,902,472 bbl. For Humble the figure represented an increase of 12.9 per cent over the 1946 period.

Atlantic Pipe Line Co. showed the

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INSIDE LINE-UP
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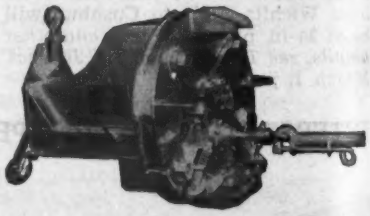

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• These protective materials for all types of structures, above and below ground, have been proved by years of service to effectively prevent corrosion under most severe conditions. Order them for your next job.

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greatest percentage gain, increasing its movements 44.6 per cent to total of 22,378,925 bbl. Utah Oil Refining Co. was second with an increase of 34.9 per cent and a total for the period of 4,616,951 bbl.

Big Inch Sale Papers Are Filed in Houston

HOUSTON. — Papers involved in the sale of the Big Inch and Little Big Inch war emergency pipe lines to the Texas Eastern Transmission Corp. were filed here last week in the office of County Clerk W. D. Miller.

The deed, totaling $143,127,000, is the largest ever filed in Harris County, Miller said.

Work Begins on 45-Mile Interstate Crude Line

Construction was under way this week on Interstate Oil Pipe Line Co.'s 45-mile, 12-in. crude-oil pipe line from the Garvin County area in southern Oklahoma to the company's Oklahoma City trunk line pump station.

Contract for the project was awarded November 19 to Midwestern Constructors, Tulsa, and right-of-way work was started from the northern terminus November 21.

At the southern end the line will connect with 2.2 miles of 12-in. line which was laid in August to extend service into Lindsey pool.

When completed, the new line will increase Interstate's pipe-line capacity out of Maysville, Katie, Antioch, and Lindsey fields.

Initial plans for the line were launched about a year ago when deeper pay zones first were discovered in that area. Gathering systems installed to serve the new pools were designed with the Oklahoma City line in mind. Part of the Maysville-Lindsey trunk line extension is to become a part of the new line.

Laying of pipe is scheduled to begin December 1, with the project due for completion January 15.

Interstate Finishing Line

Interstate Oil Pipe Line Co.'s 18-mile crude-oil loop line in the vicinity of Natchez, Miss., is scheduled for completion about December 10, according to H. L. Leake, superintendent for Latex Construction Co., contractor.

Morehead Work Progressing

Tennessee Gas Transmission Co. is receiving materials and work is progressing on schedule on its centrifugal compressor station at Morehead, Ky. Completion is scheduled for late in December.

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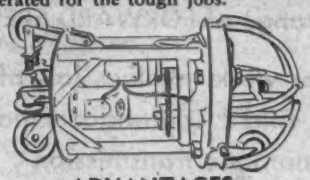
INTERNAL LINE-UP CLAMP

The electric model shown below is a rugged, heavy-duty clamp, electrically operated for the tough jobs.



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Speed; stringer bead cut-out eliminated; economy; swabbing and alignment with one tool; less labor required.

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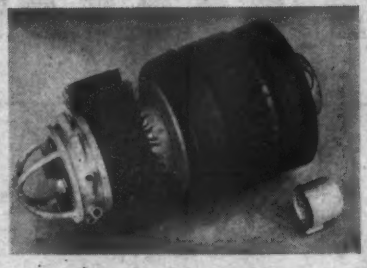

8" TYPE RC PIPE LINE PIG*
The "Jet Rotation" Scraper

Body Cap (in foreground) is installed when Pig is used for:
- Line displacing
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- Repair plugging

Type RC Pigs are available in sizes 6" to 26", for crude and products pipe lines.

*Patent pending.

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Dozer travel is 50% forward, 50% reverse, so the revolutionary new four-wheel-drive Tournadozer gives you approximately double the fastest crawler's forward speed and full range of FORWARD SPEEDS IN REVERSE.

Dozer work involves lots of shifting, so the high-speed Tournadozer has constant-mesh Tournamatic transmission . . . gives you instantaneous change of gear ratios forward or reverse, any time . . . any place. Just move lever to any gear selection you want and you're in it and ON YOUR WAY . . . RIGHT NOW.

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Dozer work has always been tough on the operator . . . Tournadozer operators ride easy on low pressure pneumatic tires . . . sit easy on hydraulic suspension seat . . . take it easy because air-actuated finger-tip controls TAKE LABOR OUT OF OPERATING.

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Increasing load on Tournadozer blade puts more weight on all four giant rubber tires giving more traction for greater dozing power.

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NATURAL GAS

Eastern Gas Companies Seeking New Facilities

Home Gas Co., Manufacturers Light & Heat Co., and Cumberland & Allegheny Gas Co. have requested the Federal Power Commission for authorization to construct and operate natural-gas transmission facilities estimated to cost $2,690,164.

Home Gas Co. proposes facilities estimated at $1,850,155 which will include: measuring and regulating stations in Deer Park Town, New York; 26.4 miles of 12-in. pipe line between Hancock and Cohocton, N. Y.; 25 miles of 10-in. line between Horseheads and the Dundee storage field; and the installation of 1,000 additional horsepower, a measuring station and a dehydration plant at the Dundee compressor station.

Manufacturers Light & Heat Co.'s proposed facilities, estimated at $709,740 include: 7½ miles of 14-in. line to various points of connection with the main pipe line of Texas Eastern Transmission Corp.; installation of a 1,000-hp. compressor station in Chester County, Pennsylvania; installation of an additional 375-hp. unit at the Waynesburg compressor station, and a measuring station and a regulator station in Chester County The company proposes to sell its Rosbys Rock and Beallsville compressor station units because of the waning gas production in this area.

Cumberland & Allegheny Gas Co. proposes to install a 7-mile, 6-in. gas line between Terra Alto, W. Va., and Oakland, Md., at an estimated cost of $130,269.

Carthage Gasoline Plant Is Under Construction

Glassell & Glassell, Shreveport, who have 21 producing wells in the Carthage gas area in Panola County, Texas, began construction last week on a new gasoline plant 5 miles east of Carthage.

Tennessee Gas Transmission Co. will tie into the plant when completed and purchase the stripped gas at a reported price of 6½ to 8 cents per 1,000 cu. ft.

Peoples Drilling 63 Wells

Peoples Natural Gas Co. is conducting 63 drilling operations in western Pennsylvania, several of which are planned for about 10,000 ft., in a search for additional gas reserves. F. H. Finn, company geologist, said the company also is drilling 23 storage wells in worked-out gas pools.

FPC Authorizes Two Firms to Build Lines

Michigan Consolidated Gas Co. and Austin Field Pipe Line Co. have been authorized by the Federal Power Commission to construct facilities for transportation of gas received from Panhandle Eastern Pipe Line Co. to the Austin storage field for subsequent withdrawal for service to the Detroit area.

Cost of the facilities to be built by Austin has been estimated at $8,151,000 and those of Michigan Consolidated at $1,174,000. The Austin facilities would be leased and operated by Michigan Consolidated.

Facilities to be built by the pipeline company include a 26 or 24-in. line extending from the Austin storage field 140 miles to a point near Detroit, a metering station at the Detroit terminal and a 3,000-hp. compressor station at the field.

Michigan Consolidated was authorized to build a 26 or 24-in. line from the eastern terminus of the Austin-Detroit line to Melvindale, Mich., and to build and operate facilities in Austin field for storage and withdrawal of gas.

Completion of Gas Feeder Line Set for December 15

Construction of 73 miles of 20-in. natural-gas feeder line for Tennessee Gas Transmission Co. between Carthage, Tex., and Natchitoches, La., is expected to be completed about December 15.

According to officials of Latex Construction Co., which is handling the construction, exact completion date will depend upon deliveries of the last 20 miles of pipe.

Last Carbon Black Plant Offered for Sale by WAA

The last of six carbon black plants owned by the Government and now operated by Charles Eneu Johnson & Co. at Monument, N. M., has been declared surplus and is being offered for sale or lease by War Assets Administration.

The plant, designed for a capacity of 15,200,000 lb. of carbon black annually, consists of a gas desulfurization plant, gas supply line, carbon black plant, two burner units with 40 burner houses each, two incomplete burner units, storage and miscellaneous buildings, and 14 dwellings

At present the property is under an interim lease which may be terminated on 30 days' notice.

Half Interest in Colorado Interstate Gas Co. Sold

A half interest in Colorado Interstate Gas Co. reportedly has been purchased from Standard Oil Co. (N.J.) by a group of investment houses for a total price of about $9,000,000.

Colorado Interstate Gas Co. is a natural-gas pipe-line transmission company which supplies gas to Public Service Co. of Colorado, Colorado Fuel & Iron Co and other firms.

The group of investment houses was headed by Union Securities Corp.

Initial Decision Approves East Ohio 84-Mile Line

An initial decision of Presiding Examiner Ewing G. Simpson granting East Ohio Gas Co. authority to build and operate its proposed 84-mile, 20-in. line in Ohio to receive gas from the Big Inch system has been published by the Federal Power Commission.

If no exceptions are filed by December 8 or a review initiated within the following 10 days, the decision becomes an order of the commission.

The company was granted a temporary authorization for the project September 3. *(The Oil and Gas Journal, September 13, page 133).*

Construction is scheduled to begin no later than next February. Overall construction cost has been estimated at $3,200,000. East Ohio is now buying 47,000,000 cu. ft. a day from Texas Eastern Transmission Corp. Under a second contract the company is entitled for 20 years to take additional quantities as Texas Eastern enlarges its facilities.

Arkansas Gas Fields Show Increase for September

Natural-gas production from the 26 gas fields of North Central Arkansas showed an increase of 1,540,000 cu. ft. daily for September over August. The daily output averaged 6,787,000 cu. ft. for September as compared to 5,247,000 cu. ft. for August

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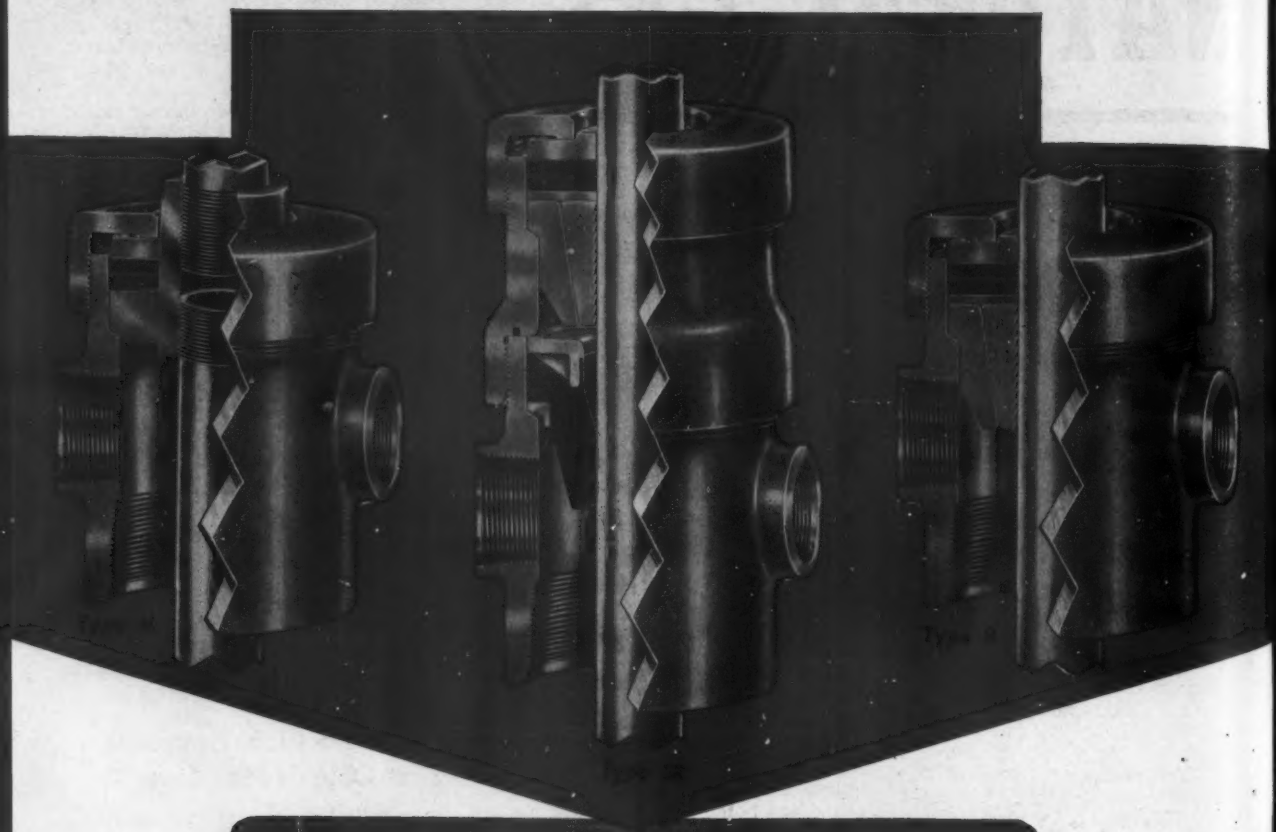

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Exploration and Drilling

First Open Water Offshore Oil Well

KERR-McGEE OIL INDUSTRIES, INC., Phillips Petroleum Co., and Stanolind Oil & Gas Co. share the honor of what will some day be marked as an event of substantial historical significance, namely, getting the first offshore oil producer in the open waters of the Gulf of Mexico.

Their No. 1, Block 32, State Lease 754, in 18 ft. of water, 12 miles off shore from Point Au Fer, Terrebonne Parish, Louisiana, has flowed 30 to 40 bbl. of oil per hour on an 8-hour test, from a Miocene sand through perforations in pipe at 1,734-50 ft.

The well was drilled to a total deph of 2,564 ft., at which depth it was 27 ft. in salt, topped at 2,537 ft. Having verified the existence of the salt dome indicated by geophysical evidence, operator backed up and tested. A drill-stem test at 1,780-81 ft. recovered 10 stands of 22.9°-gravity oil. These perforations were squeezed, and the present producing interval then tested. It is reported that electric log interpretation indicates salt water level at 1,786 ft., and also indicates possible presence of two more oil sands, one at 1,508-25 ft., and one at 1,535-85 ft.

In initial tests, through 2-in. tubing with top and bottom-hole chokes, trouble was encountered with fine sand entering and plugging up the tubing. This was finally cleared up by reverse circulation through the annulus, and experimenting with various rates of production.

Now that they are assured of the presence of a commercial accumulation of oil, the three companies face a whole host of new problems, geological, drilling, and production. The very shallow depth both helps and hurts. It helps because it makes drilling time shorter, and cuts down the size and weight of drilling equipment required. It hurts because it imposes severe limitations on the possibilities of directional drilling from the existing platform.

The present platform, drilling rig, and accessories were designed for deep testing, and the design proved sound when a hurricane on September 19 registered wind velocities in gusts up to 90 miles per hour. The platform has over-all dimensions of 38 by 71 ft., with 16 pilings of 24-in. o.d. A new platform for future development of shallow production is being designed on a 25 by 60-ft. scale, using only six pilings. A light-weight drilling rig of special design is being manufactured, using a telescopic mast and light-weight 2-cycle engines. It will break down into packaged units, none of which will exceed 30,000 lb. maximum weight.

The development pattern is already foreseen as a complex interweaving of economic and geological factors. Is this a sheet sand over the top of the dome in which oil accumulation will be found under a surface area roughly circular in shape? Or is it a flank sand in which oil will be found in a narrow arc around part of the dome? What drainage pattern should be attempted in either case? How much will it cost, per hole drilled into the producing sand, including the cost of the platforms? If it is a flank sand, and not too narrow, the variation in depth to the sand can be substantial in a very short distance. What is the maximum depth for which the special rigs should be designed to drill?

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

NORTH TEXAS.—A late report has Gay Petroleum Corp. 1 Watson, 2 miles south of Belcherville in Montague County, flowing 535 bbl. of oil in 8 hours. The conglomerate producer opens considerable new territory to exploration.

CALIFORNIA.—Jergins Oil Co. has staked location for a wildcat in Fresno County, which may determine to a large extent the possibilities of oil production from Cretaceous-age rocks in the state. The new venture is located 5 miles west of one of the few wells in the state ever to produce from this formation. Standard of California has reached a new depth record for Southern California with its wildcat in the Montalvo area of Ventura County.

EAST TEXAS.—A dual completion established Travis Peak and Lower Pettit oil production on the southeastern flank of the Carthage gas field in Panola County.

ROCKY MOUNTAIN.—The prolific Lost Soldier field in Wyoming has a new pay in the Amsden which also looks like a discovery in the Madison. Carter Oil Co.'s test on the southeast flank of Elk Basin encountered saturation in the Embar and Tensleep on its way to the Madison. A new Tensleep pool was opened in the old Torchlight field with a 1,632-bbl. well. Mush Creek is extended in two directions. In Montana, a new shallow gas field has been opened near the Canadian boundary in Flat Coulee, Liberty County.

SOUTH LOUISIANA.—The first successful offshore wildcat, Kerr-McGee 1 State Lease 754, opened a shallow salt dome discovery area, gaging over 30 bbl. of oil per hour. Superior Oil Co. of California is attempting to run electric log on their open water test.

WEST TEXAS.—Silurian production is indicated northwest of the Jordan Ellenburger field. Keystone Colby field has a new pay in the Ellenburger.

MICHIGAN

Ten Good Producers Mark Week's Work

SAGINAW.—Initial potential from the 10 oil producers among the week's 23 completions in Michigan ranged from 1,320 bbl. a day in a Claybanks-Oceana well, to 2 bbl. every other day from a wildcat development in Tallmadge Township, Ottawa County. Total potential was 4,120 bbl., 2,400 bbl. coming from 3 more good producers in Newaygo County's Kimball Lake field. Three Bay County completions were good for 207 bbl. a day, one in Allegan County for 15 bbl. and a second Claybanks producer came in for 138 bbl. Four gas producers were completed and of the nine dry holes six were wildcats. Three of nine wildcats drilled were listed for production, including the 15-bbl. Tallmadge Township well. The other was a small Newaygo County gas well.

New locations for the week declined to 12 in 9 counties, including 3 in Bay County, 2 in Van Buren, 1 each in Newaygo, Kent, Allegan, St. Clair, Oceana, Arenac and Muskegon.

MICHIGAN SUCCESSFUL WILDCATS

Allegan County, Salem Township: Leonard C. Sleep 1 Utton, NW SE SW 34-4n-13w, pumping 15 bbl., with salt water, acidized, in Traverse, TD 1,692 ft.

Newaygo County, Big Prairie Township: Sun Oil Co. 1 Westcott, SW SW NW 33-13n-11w, gas well, 750,000 cu. ft., TD 3,102 ft., plugged back to 2,909 ft.

Ottawa County, Tallmadge Township: Carl E. Grimes 1 Bauma, SE SE NW 35-7n-13w, flowing 2 bbl. per 48 hours, TD 1,880 ft. in Traverse.

MICHIGAN WILDCAT FAILURES

Allegan County, Manlius Township: James J. McGerry, Tr., 1 Baumgarten, NE NE SE 19-3n-15w, dry in Traverse, TD 1,380 ft.

Montgomery County, Rust Township: Beacon & Vegors 1 Carrier et al, NW NE SE 30-30n-4e, dry, TD 2,356 ft.

Newaygo County, Grant Township: Augie Busk 1 Westbrook et al, SE NE NW 28-11n-12w, dry in Traverse, TD 2,475 ft.

Monroe Township: Michigan Consolidated Gas Co. 1 Stirling Bank, C-W 36-15n-12w, dry, TD 1,160 ft.

Ottawa County, Wright Township: Del Fortney 1 Zahn & Brown, NW NE SE 30-8n-13w, dry in Alpena, TD 1,942 ft.

Van Buren County, Bangor Township: Stuart L. Godfrey 1 Barker, C-N NW NW 23-2s-16w, dry in Traverse, TD 1,073 ft.

SOUTH LOUISIANA

First Open Water Wildcat Success

NEW ORLEANS.—Twelve miles off Terrebonne Parish shore in the Gulf of Mexico, Kerr-McGee Oil Industries, Inc., et al 1 State Lease 754, Block 32, opened a new shallow salt dome discovery area in the Ship Shoal area. Drilled to a total depth of 2,564 ft. in salt, with top of salt encountered at 2,537 ft., this well flowed by heads for several days and on last gage flow was almost steady and gaged between 30 to 40 bbl. of oil per hour on an 8-hour test. It was showing very little gas and was making some soft sand. Production is through perforations at 1,734-50 ft. Present sands being tested are in the Miocene and the well is credited with three additional sands above that depth one 65 ft. thick, another 55 ft. thick and a third 18 ft. thick. Log indicated salt water sands topped at 1,786 ft.

The first oiler in the West Barataria producing area of Jefferson Parish has been completed at F. A. Callery and E. G. Bateman 1 Baird. Total depth is 9,000 ft., and pipe is perforated from 8,250-54 ft. for completion. On initial gage the well flowed 240 bbl. of oil per day through a 9/64-in. choke with 1,014 psi. flowing pressure on the tubing and 1,375 psi. casing pressure. Gravity of oil is between 36° and 38°, corrected.

Off shore, 19 miles south out in the Gulf of Mexico off Vermilion Parish shore, Superior Oil Co. of California 1-A Gulf of Mexico, State Lease 884 on Block 71, is attempting to run log. Total depth is 12,920 ft. and the well attempted to blow out while coming out of the hole. After weighting mud and circulating, operators attempted to run electrical log, but would not go below 12,545 ft. Several bridges were found in the hole and operators were circulating each joint down trying to get on bottom. Nearest production is 22 miles to the north in Fresh Water Bayou field.

Amerada Petroleum Corp. 14 C. E. Gheens, in Des Allemands field in Lafourche Parish, has been completed as a possible new sand discovery. Well is located in Section 37-15s-20e, and was drilled to a total depth of 8,407 ft. in salt. Casing was set at 8,226 ft. and perforated from 8,130-66 ft. for the completion. On official gage the well flowed 189 bbl. of 32.3°-gravity oil through an 8/64-in. choke with a gas-oil ratio of 460 cu. ft. Tubing pressure 1,200 psi. and 0.2 per cent water was in the flow.

There were 11 new locations this week with only one being a wildcat start in St. Landry Parish. Eleven oil wells were completed in proven areas while 6 were dry, 2 being wildcats 1 each in Lafourche and St. Bernard parishes.

SOUTH LOUISIANA WILDCAT FAILURES

Lafourche Parish: Gulf Refining Co. 18 Delta Sec. Co., Inc., 36-19s-21e, in Bully Camp area, old total depth 7,098 ft.,

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sidetracked TD 7,000 ft. in 3rd ST hole, dry.

St. Bernard Parish: Sun Oil Co. 2 Robinson Estate, 78-14s-14e, in Kenilworth area, dry, TD 11,695 ft.

MISSISSIPPI

Wayne County Test Looks Promising

JACKSON.—A new oil discovery is indicated for Wayne County, in the Boyce area. Hughes & Sistrunk 1 G. M. & O., located in Section 24-9n-8w, has cored and drill-stem tested oil shows in the upper Eutaw and is now preparing to take a fourth drill-stem test at total depth of 5,145 ft. in the Stanley sand. This well cored continuously from 4,967 ft. to a top of the Morrison sand to the present total depth and has recovered a small amount of oil cut with mud on drill-stem test at 5,043-67 ft. and 5,072-90 ft. in the City Bank sand zone and 5,113-27 ft. in the Stanley sand. Schlumberger log was run and tops were picked as follows: Zilpha 860 ft., Winona 1,090 ft., Wilcox 1,330 ft., Midway 3,380 ft., Chalk (Clayton) 3,847 ft., Eutaw 4,950 ft., Morrison sand 4,962-76 ft., City Bank sand 5,037-94 ft. (33 ft. shaly to fairly porous sand), Stanley 5,110 ft. (porous 5,113-29 ft., grading to shaly 5,120-27 ft.), end of log 5,126 ft.

At Ovett, in Jones County, Gulf Refining Co. 1 L. L. Majors, 29-6n-11w, is testing for a conventional dual completion after failure of attempts to employ a cross-over packer. Several tests of the lower perforations from 12,011 ft. to 12,288 ft., using a 3/8-in. tubing choke, have shown a diminishing flow rate and pressure. Initial tests flowed at the rate of 10.55 bbl. of 42°-gravity oil per hour with tubing pressure of 250 psi. while a 23-hour test ending November 20, 1947, flowed at the rate of 7.4 bbl. per hour while tubing pressure had declined to 120 psi. The wel will flow through the casing after being shut in to build up pressure.

Gulf Refining 1 R. W. Trotter, in Hinds County, encountered trouble in sidetracked hole and has been completed dry after sticking at total depth of 4,523 ft. Tota depth of original hole was 5,975 ft. Operators will start another test located 115 ft. north and 164 ft. west of No. 1.

Two wildcat starts were reported this week, 1 each in Adams and Issaquena counties while 6 development locations were made, 1 in Brookhaven field, Lincoln County; 2 in Baxterville field, and 3 in Mallalieu field, Lincoln County.

MISSISSIPPI WILDCAT FAILURES

Hinds County: Gulf Refining Co. 1 R. W. Trotter, NW NE 15-7n-2w, dry, TD 5,975 ft. in original hole, 4,523 ft. in sidetracked hole; electric log tops, Wilcox 2,321 ft., Midway 3,716 ft., Gas rock 3,837 ft., base gas rock 4,492 ft., Eutaw 5,021 ft., Tuscaloosa 5,390 ft., Cap rock 5,674 ft., end of log 5,682 ft.

Humphreys County: Slick Oil Co. 1 J. V. Hines, NW SW 21-14n-2w, dry, TD 5,080 ft.

ALABAMA WILDCAT FAILURE

Crenshaw County: Nelson Exploration Co. 1 Smith Lumber Co., NW 26-8n-16e, dry, TD 9,017 ft., electric log tops: Ripley 746 ft., Selma 960 ft., Eutaw 2,188 ft., Tuscaloosa 2,595 ft., Marine Tuscaloosa 2,930 ft., Base Marine Tuscaloosa 3,010 ft., Massive sand 3,043 ft., Comanche 3,156 ft., Cotton Valley 6,460 ft.

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N. CENTRAL TEXAS

New Caddo Pool For Throckmorton County

WICHITA FALLS.—New Caddo production was indicated for Throckmorton County, 2½ miles southeast of the Graham-Magnolia field, at H. F. Manning 1 Manning-Graham, Block 994, TE&L Survey. The wildcat had top of the Caddo at 3,910 ft. and drilled out to 3,928 ft., where a 1-hour drill-stem test recovered 240 ft. of mud and 90 ft. of clean oil. Operators said a leaky packer had caused the mud recovery and were preparing to make further tests.

Three miles northwest of Throckmorton, a second Caddo producer confirmed the new field opened by Fred M. Manning, Inc., at the 1-K Unit, R. A. Brown. The west offset test, 2-K Unit, R. A. Brown, Block 244, BBB&C Survey, topped Caddo limestone at 4,455 ft. A 40-minute drill-stem test between 4,456-75 ft. brought gas to the surface in 3 minutes and flowed oil at the end of 35 minutes. Total recovery was some 300 ft. of oil. A second test determined the extent of oil pay when gas-cut drilling mud and salt water were recovered at 4,475-95 ft. Operators planned to drill ahead to test the Mississippian.

Two Montague County exploratory wells were reported to be showing for commercial production in the Bend conglomerate. Two miles south of Belcherville, Bay Petroleum Corp. 1 Watson reported a flow of 44 bbl. of oil in 30 minutes from conglomerate pay between 5,677-83 ft. Production tests were to be made when it had cleaned itself. One mile southwest of Montague, Sinclair Prairie Oil Co. and Continental Oil Co. 1 Gronow recovered 60 ft. of oil and some drilling mud on a 30-minute drill-stem test at 6,231-36 ft., in the conglomerate. Bottom-hole pressure rose to 2,050 psi. in 15 minutes when shut in. Operators were drilling ahead.

In Wichita County, 4 miles northwest of Holliday, Alexander Goldsmith 1 Kempner, Lot 55, Block 4, A. Roesch Survey, shot with nitro between 3,900-25 ft., and started flowing oil when cleaned out to within 500 ft. of bottom. It was said to have cleaned slowly, heading every 6 hours. It was shut in for storage and no estimate was made as to its potential.

In north central Archer County, Henry Grace Production Co. 1 Wilson, Block 72, ATNCL Survey, extended the North Chalk Hill Strawn field 1 mile to the southeast. Details were lacking but the extension was completed flowing 153 bbl. of 42°-gravity oil in 3 hours, with total depth at 4,021 ft.

Increased drilling of development wells was reported from the Wichita Falls area, and other North and West Central Texas fields. New exploration wells included C. V. Mangram and J. E. Gray Drilling Co., Wichita Falls, 1 Rigsby, which will be a 3,000-ft. test in the northwest corner of Clay County, about 4 miles northwest of Charlie. In Jack County, Warren Oil Corp. staked location for its 11-D Moore, in the J. W. Williams Survey, A-877, as a 5,000-ft. outpost test to the Ellis pool. Continental Oil Co. staked its 1 Copeland as a 6,300-ft. wildcat test in Section 2,719 TE&L Survey.

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6 miles west of Perrin, in Jack County. Roeser & Pendleton, Inc., will drill a shallow cable-tool test to the Cisco limestone at its 10-B W. I. Cook Estate. Location is Section 90, ET Survey, 8 miles northwest of Albany.

First official information on Skelly Oil Co.'s Ellenburger prospect in Nolan County was released this week. The 1 L. E. Adrian, Section 53, Block 20, T&P Survey, 10 miles southeast of Sweetwater, had top of the Ellenburger at 6,335 ft., drilled out to 6,430 ft., then set pipe and perforated between 6,340-64 ft. and 6,367-80 ft. After a 1,000-gal. acid treatment, the well swabbed and flowed 37.6 bbl. of oil in 6 hours. It kicked off after a second treatment and flowed 68 bbl. of oil in 34 hours. There was no water with the oil. Further tests were to be made when the rotary rig is moved.

NORTH CENTRAL TEXAS SUCCESSFUL WILDCATS

Archer County: Henry Grace Production Co. 1 L. F. Wilson, Blk. 72, ATNCL Sur., Lot 3, 7 mi. NE Archer City, flowed 153 bbl. 42°-gravity oil in 3 hr., 20-64-in. choke, GOR 425 cu. ft., casing pressure 750 psi., tubing 300 psi., sand pay 3,975-4,018 ft., TD 4,021 ft.

NORTH CENTRAL TEXAS WILDCAT FAILURES

Archer County: Scott Bros. 1 T. B. Wilson, Sec. 2, S. P. Ellis Sur., 4 mi. S Mankins, dry, TD 1,616 ft. in shale.

Cooke County: Burk Royalty Co. 1-B H. M. Ramsey, M. French Sur., 6 mi. NE Gainesville, dry, TD 4,315 ft. in shale.

Nu Enamel Oil Corp. 1 John McIntosh, C. F. Stanley Sur., 3 mi. E. Bulcher, dry, TD 3,000 ft., Ellenburger 2,951.

Cottle County: Stanolind Oil & Gas Co. 1 T. J. Richards, Sec. 1, I&GN RR Sur., 4 mi. S Paducah, dry, TD 7,886 ft., Gunsight 4,040 ft., Mississippi 7,083 ft., Hickory sand 7,853 ft., elevation 1,786 ft.

Wichita County: J. H. Gray et al 1 Paul Harrell, John V. Wheeler Sur., NW Wichita Falls, dry, TD 4,220 ft., KMA lime 4,261 ft.

Young County: Nu Enamel Oil Corp. 2 Nannie Daws, Sec. 340, TE&L Sur., 5 mi. S Padgitt, dry, TD 2,318 ft. in shale and lime.

WEST CENTRAL TEXAS SUCCESSFUL WILDCATS

Jones County: M. G. Hansbro 1 A. B. Hunter, Sec. 27, Blk. 15, T&P Sur., 4 mi. N Hawley, pumped 50 bbl. 39-gravity oil a day, lime pay 2,203-10 ft., TD.

Taylor County: Geochemical Surveys 1 J. Patterson, Blk. 17, Grimes School Land Sur., 1½ mi. NE Merkel, flowed 111 bbl. oil a day, 14/64-in. choke, 41-gravity, Dotham sand 2,225-40 ft., TD, GOR 200 cu. ft.

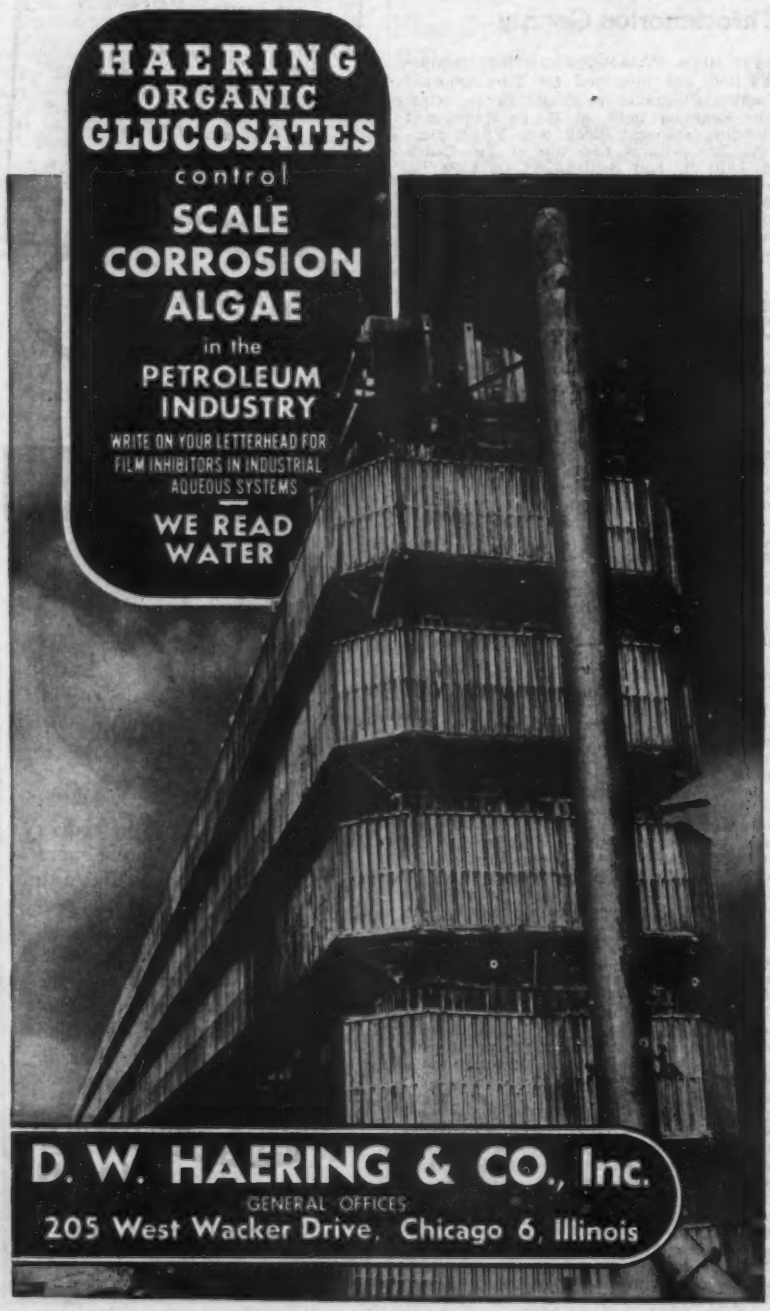
W. W. Harvey et al 1 M. N. Ferrell, Blk. 1, Grimes School Land Sur., 2½ mi. SE Merkel, flowed 102 bbl. 40-gravity oil a day, 14/64-in. choke, Flippen lime 2,463-69 ft., TD, GOR 200 cu. ft.

Throckmorton County: Fred M. Manning, Inc., 1 R. A. Brown "K," Sec. 261, BBB&C Sur., 5 mi. NW Throckmorton, flowed 101 bbl. in 4 hr., 20/64-in. choke, casing pressure 620 psi., tubing 360 psi., TD 5,008 ft., PB to Caddo at 4,735 ft., perforated 4,456-61 ft.

WEST CENTRAL TEXAS WILDCAT FAILURES

Stephens County: S. D. Johnson 1 Rogers, Sec. 19, Blk. 7, T&P Sur., 13 mi. S Breckenridge, dry, TD 2,392 ft.

Taylor County: Geochemical Surveys 2 J. Patterson, Blk. 17, Grimes School Land Sur., 1½ mi. NE Merkel, dry, TD 3,004 ft., Flippen sand 2,575 ft., Hope 2,725 ft., Reef lime 2,925 ft.



SOUTHWEST TEXAS

Edroy Field Gets One Mile Northeast Extension

CORPUS CHRISTI.—The Edroy field in San Patricio County, has been extended 1 mile northeastward by Southern Minerals Corp. 1 Mrs. C. H. Gerdes, located in the George H. Paul's Subdivision of Welder Ranch. This well was drilled to a total depth of 5,959 ft. and 5½-in. casing set on bottom. Casing was perforated at 5,940-48 ft. and 5,950-52 ft., and it flowed gas and condensate through a ⅛-in. choke, with no gage yet, tubing pressure 2,110 psi., casing pressure 2,225 psi.

LaGloria Corp. 1 Moos, a wildcat 2 miles northeast of Bandera field and 6 miles southwest of Ben Bolt field, in Jim Wells County, was drilled to a total depth of 6,500 ft., the 5⅝-in. casing was set to 6,312 ft. and perforated originally at 6,234-36 ft. Operators ran drill-stem test and swabbed through the tool, getting a small amount of oil and water and mud (estimated 5 bbl. of oil), and recovered 180 ft. of oily mud and 180 ft. of mud and sand when the tool was pulled. The 2-in. tubing then was run and the well swabbed wash water, mud and oil. These perforations were squeezed. Operators are waiting on cement to set before reperforating for a new test.

Humble Oil & Refining Co. 1-P Flour Bluff-State, wildcat, ½ mile northeast of Flour Bluff field, was completed for 132.48 bbl. oil per day through a ⅛-in. choke, gas-oil ratio 625 cu. ft., 42.5°-gravity oil, tubing pressure 1,050 psi. Production is through perforations at 6,634-46 ft. Operators are waiting on official potential gage.

There were 32 locations reported this week 10 of which were wildcat starts, located 2 in Duval, and 1 each in Bastrop, Caldwell, Jim Hogg, LaSalle, Val Verde, Webb, Williamson and Zapata counties. One successful exploratory test opened a new pay for East Premont field in Jim Wells County, while 10 wildcats were failures, 3 in La Salle, 2 in Zapata, and 1

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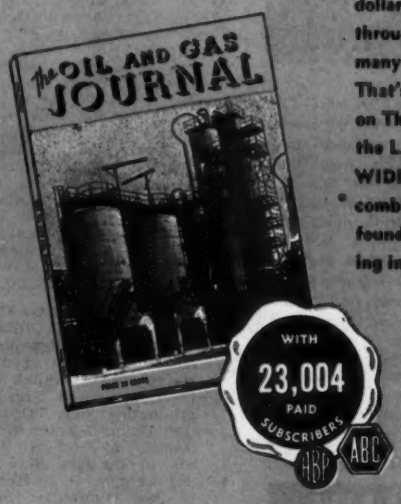

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each in Atascosa, Caldwell, Nueces, Travis, and Webb counties.

SOUTHWEST TEXAS SUCCESSFUL WILDCAT

Jim Wells County: New oil pay East Premont field—Magnolia Petroleum Co. 107 A. A. Seeligson, in Jas. A. Houghton Sur., 4 mi. NW of Premont, top pay 4,686 ft., TD 6,105 ft., perf. 4,688-95 ft., IP: 141 bbl. oil per day through a 8/32-in. choke, gas-oil ratio 471 cu. ft., TP 500 psi., casing sealed, gravity 39.4°, no water.

SOUTHWEST TEXAS WILDCAT FAILURES

Atascosa County: H. H. McFarland & L. R. Patton 1 U. A. Domsch, in W. W. Williams Sur. 28, top Austin chalk 3,500 ft., dry, TD 3,557 ft.

Caldwell County: W. Killam 1 Sally E. Clark, Esther Berry Sur., 3 mi. S of Lockhart, Austin chalk 2,036 ft., Georgetown lime 2,380 ft., Edwards lime 2,427 ft., no shows, dry, TD 2,434 ft.

LaSalle County: La Salle Oil Co. 1 R. M. Harriss, in I&GN Sur. 42, just northwest of Bolton townsite, dry, TD 6,450 ft.

Newman Bros. Drlg. Co. and Skinner & Eddy Corp. 1-F South Texas Syndicate, in H&GN Sur. 103, dry, TD 3,622 ft.

Fred W. Shield and Navillus Oil Well Serv. Co. 1 Sam Evans, in James Bridges Sur. 5, 6½ mi. SE of Artesia Wells, dry, TD 5,517 ft.

Nueces County: Tom Graham 1 Lueckemeyer, in Los Sauces Grant, 1½ mi. SE of Agua Dulce, dry, TD 6,230 ft.

Travis County: E. R. Marts 1 John B. Pope, Jr., in Jose Antonio Navarro Sur., 1 mi. NE of Garfield, Edwards lime 1,948 ft., no shows, dry, TD 1,962 ft.

Webb County: Dulaney Oil Co. 1 J. G. Garcia, in Los Ojueles Grant, 2 mi. S of Oilton, dry, TD 1,915 ft.

Zapata County: W. D. Kennard et al 1 Maria Garcia et al, Charco Redondo Grant, 18 mi. E of Zapata, dry, TD 820 ft.

Reynolds Drlg. Co. 1 F. Cuellar, in Mrs. A. E. Baker Sur. 411, dry, TD 3,418 ft.

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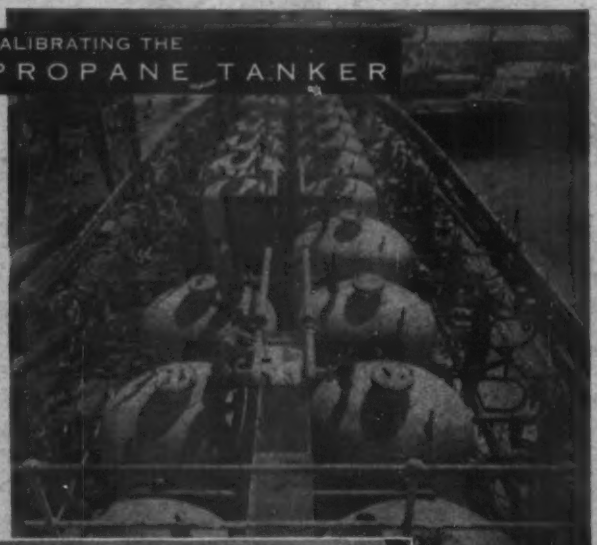

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TEXAS GULF COAST

New Pay For Sugar Valley Southeast Extension

HOUSTON.—A new deep producing zone in the Sugar Valley southeast extension area, Matagorda County, has been opened by Humble Oil & Refining Co. 2 Florence V. Bouldin, ½ mile southwest of the Truitt & Gravier 1 discovery well, and in the Freeman George Survey. On potential gage this well flowed 192 bbl. of oil per day through a 5/32-in. choke with a gas-oil ratio of 530 cu. ft. Flowing pressure on the tubing was 1,075 psi. and gravity 28.7° corrected. Total depth is 10,190 ft., and production is through perforations at 10,131-136 ft.

Stanolind Oil & Gas Co. 1 State Tract 104, 1½ miles north-northwest of the Matagorda Bay field oil discovery well and 1½ miles northwest of nearest gas production, flowed gas through a ¼-in. choke on drill-stem test through perforations at 5,518-30 ft., developing 1,635 psi. working pressure in 30 minutes, 2,050 psi. shut-in pressure. Total depth is 5,657 ft., with 5½-in. casing set to 5,611 ft. This well is located on State Tract 104, in Matagorda Bay, Calhoun County, 5½ miles north of Port O'Connor.

A second new producing segment off the flanks of the Batson dome in Hardin County, has been opened by Hawkins & Graham, Inc. 1 Coline Oil Co., loctated in the M. A. Harrison Survey. Drilled to a total depth of 5,356 ft. in heaving shale, the 7-in. pipe was cemented on bottom. The well now is flowing an ungaged amount of 38.8°-gravity pipe-line oil through perforations at 5,271-73 ft. This well is 1 mile north of the 1 Charles G. Hooks et al which opened new production off the west flank of the dome approximately a month ago.

Cities Service Oil Co. 3 Kariker Lumber Co., in the Nancy Fuller League, on the east flank of the Saratoga dome in Hardin County, flowed 107 bbl. of 38.1°-gravity oil daily through 104 perforations at 5,776-5,800 ft. in sands topped at 5,678 ft. Flowing pressure on tubing was 400 psi. and 800 psi. on the casing. Cities Service has made a new location still farther south on the same lease, the 4 Kariker Lumber Co., which is projected to 6,500 ft.

The 41 new locations reported this week included 12 wildcat starts, 2 each in Brazoria, Orange and Wharton, and 1 each in Fort Bend, Galveston, Harris, Karnes, Live Oak, and Walker counties. Eleven of the development locations were in the Bloomington field of Victoria County. Thirteen oil wells were completed and 5 dry holes in proven areas while 8 were wildcat failures, 2 in Liberty and 1 each in Brazoria, Jackson, and Waller counties.

TEXAS GULF COAST WILDCAT FAILURES

Brazoria County: Magnolia Pet. Co. & J. S. Abercrombie Co. 1 Leon Jordan, in Hallie Bowers Subd. of S. F. Austin 7½ Lge., 9,000 ft. NE of Old Ocean field production, dry, TD 11,689 ft.

Jackson County: Teten & Pratt 1 Rudolph Yaussi, in John M. White Sur., 3 mi. SW of Cordele, dry, TD 3,000 ft.

Liberty County: H. L. Hunt 1 B. E. Quinn, in Jas. Humphries Sur., 3 mi. S of Cleveland field production, 7 mi. SE of Cleveland townsite, dry, TD 7,344 ft.

Floyd L. Karsten 1-B B. E. Quinn, in D. Donaho Sur., McCoy field area, dry, TD 8,860 ft.

Waller County: Pan American Prod. Co 1 A. E. Humphreys et al, in Jno. H. Pierson Sur., 4 mi. W og Magnolia townsite, dry, TD 9,772 ft.

LA.-ARK.

Catahoula Parish Wildcat Drills Ahead After Shows

SHREVEPORT.—Hunt Oil Co. 1 Louisiana Delta Lumber Co., Tuscaloosa test in 6-4n-8e, Catahoula Parish, was drilling ahead below 10,015 ft. in a formation tentatively identified as the lower Cretaceous, after coring some shows higher in the hole. Between 9,819-31 ft. the recovery was 3 ft. of sandy shale, 3 in. of hard lime having a slight odor, and 3 ft. of shale and sand streaks. Broken sand, with streaks of lignite, from 9,875-81 ft. had a slight odor and taste of distillate. Operators then made a drill-stem test at 9,866-91 ft., and in 45 minutes recovered 50 stands of salt water having a slight show of oil. There were no further shows in cores to 9,962 ft. Formation tops logged were the Selma 7,880 ft., Tuscaloosa 9,304 ft., pilot sand 9,782 ft., with an elevation of 38 ft.

About 12 miles east of the Olla field, H. L. Hunt 139-F Nebo Oil Co., 19-10n-5e, western Catahoula Parish wildcat, was reported below 5,415 ft., with no details forthcoming.

In Bienville Parish, Union Producing Co. and Pure Oil Co. 1 Nebo Oil Co., C SE 30-14n-5w, was rigging up to wash down and make further tests in the James limestone and Pettit formations. Operators had drilled cement plug to 45 ft. to install a blowout preventer. This test was previously abandoned in the Travis Peak at 7,784 ft.

In DeSoto Parish, Skelly Oil Co. 1 Nasn, 20-12n-16w, had corrected total depth at 11,664 ft. Latest perforations were at 11,610-650 ft., drill-stem tested for 1 hour and 30 minutes. There was no top pressure and recovery was 2 stands of slightly oil-cut mud and 31 stands of mud. It was to plug back to 9,280 ft. and perforate at 9,150-9,250 ft. in the Cotton Valley. In 19-12n-14w, Phillips Petroleum Co. 1 Gilliland was drilling below 5,412 ft. in the lower Glen Rose. Sample tops placed the Paluxy at 2,920 ft., and the Massive anhydrite at 4,790 ft.

In Claiborne Parish, Carter Oil Co. 1 Gandy, 28-19n-7w, was drilling below 8,980 ft. in hard sand identified as the Travis Peak. Hassie Hunt 1 G. W. James, 10-22n-4w, had corrected total depth at 11,007 ft., in salt, topped at 10,987 ft. Operators were to test higher in the hole, and side-wall cores in the Cotton Valley at 9,737-48 ft. recovered white sand with no shows.

In East Carroll Parish, Union Producing Co. 1-A O'Brien, 5-10-11e, was drilling below 5,813 ft. in shale, igneous and limestone, with no shows. Pan American Producing Co. staked a ½-mile southwest offset to the D'Arbonne field discovery in Lincoln Parish. The second test will be 1 H. Brewster, NW NE 6-19n-1w.

In Union County, Arkansas, H. B. Ward 1 G. A. Patterson, NW NE NW 30-18s-14w, 4 miles west of the Hillsboro field, stopped at 2,467 ft., in the Nacatoch sand topped at 2,023 ft., to test an oil show around 2,460 ft. It was perforated at 2,462-64 ft., swabbed 7 hours and produced mud, salt water and a show of gas. Operators were to squeeze. North of the Champagnolle field, Curtiss Kinard 1 Anthony Lumber Co., SW SE 34-16s-14w, was drilling below 3,580 ft.

In Lafayette County, J. K. Wadley 1 H. D. Haberyan, 7-16s-24w, was drilling below 4,157 ft. in the Paluxy. Operators ran electric log to 3,805 ft. and reported the Midway at 1,080 ft., Nacatoch 1,920 ft., Saratoga 2,180 ft., Annona 2,545-2,670 ft., Tokio 3,010 ft., and the Paluxy at 3,725 ft., on an elevation of 278 ft. Marine Oil Co. 1 Crawford, 17-12s-9w, Bradley County, had total depth at 4,500 ft. and were to run electric survey. Operators believed it still in the Eagle Mills formation topped at 3,885 ft. In Columbia County, Chicago Corp. 1 Chaffin, 29-18s-20w, was drilling below 8,127 ft. in Cotton Valley.

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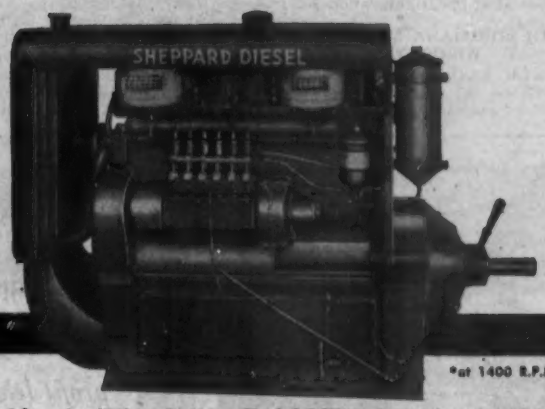

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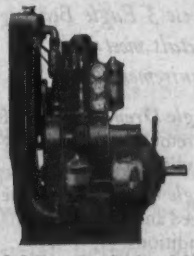

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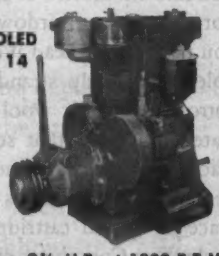

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Sheppard DIESELS

NORTH LOUISIANA WILDCAT FAILURES

DeSoto Parish: F. A. Gallery 1 Ellerbe, E½ SE SW 18-15n-12w, dry, TD 4,913 ft., Saratoga 1,170 ft., Eagleford 2,450 ft., Paluxy 2,486 ft., Massive anhydrite 4,250 ft., elevation 172 ft.

Franklin Parish: Roy Fisher 1-A Tensas Delta, NE NE NE 5-11n-6e, dry, TD 7,138 ft., Austin 5,840 ft., Eagleford 6,190 ft., Tuscaloosa 6,345 ft., Marine Tuscaloosa 6,908 ft., elevation 46 ft.

Richland Parish: George B. Franklin 5 Fee, 20-18n-6e, dry, TD 2,795 ft.

Webster Parish: Hunt Oil Co. 1 Haynesville Mercantile, NE NW 9-23n-9w, dry, TD 12,359 ft., sample top on Buckner reported as 10,186 ft., elevation 304 ft.

NORTH LOUISIANA SUCCESSFUL WILDCAT

DeSoto Parish: E. C. Laster 1 Witherspoon, SW SE NW 3-14n-14w, flowed at rate of 1,331,000 cu. ft. gas, 10.39 bbl. of 65°-gravity distillate and 10 bbl. salt water, 16/64-in. choke, Rodessa perforations 5,254-66 ft., TD 5,489 ft., flowing tubing pressure 1,010 psi., casing pressure 1,150 psi., shut in for outlet.

ARKANSAS WILDAT FAILURES

Nevada County: R. H. Crow et al 1 Grove Land & Timber Co., NE NE NW 5-15s-20w, dry, TD 4,021 ft., Saratoga 1,740 ft., Tokio 2,331 ft., Massive anhydrite 2,470 ft., James 3,171 ft., Travis Peak 3,406 ft., elev. 334 ft.

Ouachita County, previous completion: Jack Carnes 1 Scott, NW NW SE 18-14s-18w, dry, TD 2,650 ft., Nacatoch 1,345 ft., Saratoga 1,603 ft., Annona 1,800-52 ft., Meakin 1,852 ft., Tokio 2,280 ft., James 2,300 ft., Travis Peak 2,430 ft.

Union County: Mul-Berry Oil Co. 1 A. Hearion, E½ NE SW 19-18s-14w, dry, TD 4,069 ft., Saratoga 2,535 ft., Lower Cretaceous 3,265 ft., Travis Peak 3,600 ft., elev. 210 ft.

Previous completion: Lion Oil Co. 1 Saw, SE SW NW 7-17s-12w, dry, TD 3,858 ft., Arkadelphia 2,135 ft., Nacatoch 2,275 ft., Saratoga 2,495 ft., Meakin 2,665 ft., Travis Peak 2,947 ft., Cotton Valley 3,710 ft., elev. 175 ft.

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APPALACHIAN FIELD

Chestnut Ridge Wildcat Being Watched Closely

PITTSBURGH.—In Springhill Township, Fayette County, Pennsylvania, south along the axis of Chestnut Ridge from the gas pool, New Penn Development Co. et al topped the Tully lime at 6,652 ft. or datum of —4,332 ft. in the wildcat on Paul E. Dunham tract. In 1939, a well was drilled on this tract near Wymps Gap which had the Tully at —4,428 ft., or 96 ft. lower; but it had an abnormally thick section of 882 ft. from the Tully to the top of the Onondaga, suggesting a fault, as the samples showed evidence of slikensiding. The Tully section in the new test is 10 ft. thinner which, if the Hamilton and Marcellus have a normal thickness, may prove extremely interesting.

In Richmond Township, Crawford County, Pennsylvania, Bean & White struck black water at 4,100 ft. in the wildcat on Harry F. White farm, which rose 3,000 ft. in the hole. This is 892 ft. below the Oriskany horizon.

New locations in southwest Pennsylvania totaled 9; in Madison Twp., Armstrong County; Dunkard & Wayne Twps., Greene County; Clover Twp., Jefferson County; Donegal and Somerset Twps., Washington County, and Allegheny Twp., Westmoreland County.

On Briery anticline in Portland district, Preston County, West Virginia, Snee, Eberly et al are drilling 56 ft. in the Corniferous lime in the test on the Virginia Cuppett farm, and have drilled through the light colored chert in which the gas in both of the preceding two tests was found. The chert at the present depth of 5,530 ft. is dark. Since neither of the two preceding wells was drilled deeper than the light colored chert, no correlation is possible but this test is the highest on structure in the new gas pool and sand conditions will be important. This section is expected to be about 150 ft. thick.

In Ripley district, Jackson County, E. H. Staats Drilling Co. topped the Corniferous lime at 4,673 ft. or datum of —4,053 ft. in the test on the G. W. Swisher farm. Columbian Carbon Co. drilled through the Oriskany sand (5,100-72 ft.) in the test 963 J. M. Bibbee, and shot the sand which had a small showing of gas. The bottom of the casing was shot off and the well is standing with a gage of 365,000 cu. ft. gas.

New locations in West Virginia totaled 13; in Crook dist., Boone County; Birch dist., Braxton County; Washington dist., Calhoun County; Ravenswood dist., Jackson County; Slab Fork dist., Raleigh County; Harper dist., Raleigh County; Booths Creek dist., Taylor County; Stonewall dist., Wayne County; Baileysville and Oceana dists., Wyoming County.

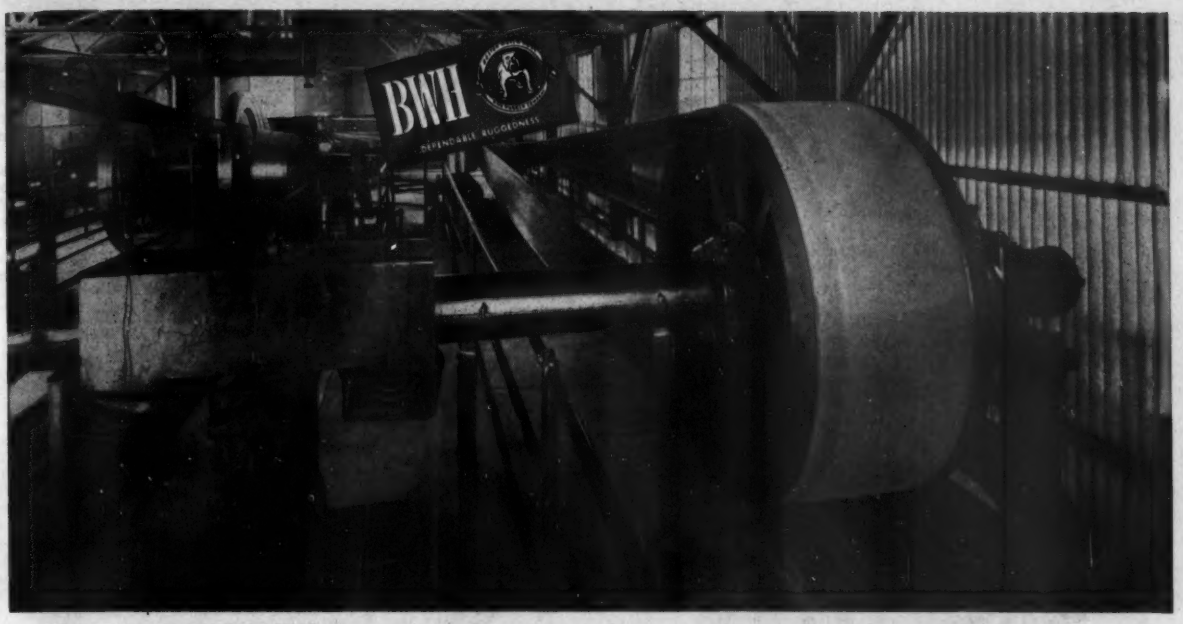
PENNSYLVANIA WILDCAT FAILURE

Greene County, Franklin Township: Manufacturers Light & Heat Co. 1 Waynesburg Water Co., dry, TD 3,320 ft.

WEST VIRGINIA SUCCESSFUL WILDCATS

Marion County, Winfield district: Alex Watson 1 J. Harper Meredith, 300,000 cu. ft. gas, Bayard sand, TD 2,320 ft.

Wayne County, Grant district: Owens Libby Owens Gas Department 764 C. E. Counts, 2,768,000 cu. ft. gas, Big lime, TD 1,598 ft.



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KANSAS

Three Wildcats Hold Sunflower State Interest

THREE wildcats have attracted interest in past week with shows of oil. John Lindas 1 Hutchinson, SE SE NW 17-23-17, 7 miles west of Zook pool, Pawnee County, got 450 ft. of oil in hole from perforations at 4,310-12 ft. Hole was drilled to total depth of 4,655 ft. in Arbuckle and casing at 4,350 ft. Best show of oil in Kinderhook from 4,288-91 ft.

Stanolind Oil & Gas Co. 1 Wheatley, C NE SW 23-33-31, 20 miles northeast of Liberal, Seward County, swabbed ⅛ bbl. of oil and 15 bbl. water per hour from St. Louis section of Mississippian. Test was from plugged back depth of 6,032 ft. after reaching total depth of 7,340 ft. in Arbuckle. Drill-stem tests indicated several good shows of oil and gas in Mississippian and Lansing.

Third wildcat of interest, J. P. Gaty 1 Tobin, CNL NW NE 29-26-2e, Sedgwick County, 6 miles northwest of Wichita and 1½ miles west of South Greenwich pool, had good show of oil in drill-stem test of Mississippi at 2,946-52 ft. Test was drilled ahead to Viola, with total depth of 3,314 ft., and no further shows were recorded.

Shallow Water Refining 1 McHugh, C SW SW 23-21-34w, has been completed for 779 bbl. daily and opened new shallow producing horizon in Nunn pool, Finney County. McHugh was originally completed by Atlantic Refining Co. in 1945 in McHugh sand for 10 bbl. daily at 4,000 ft. New pay is in Marmaton lime. Other production in pool is from Mississippi lime at around 4,700 ft.

Herndon Drilling Co. 1 McCauley, SW SW SW 6-16-13, ¼ mile north of Eveleigh pool and 1 mile west of Hoisington, Barton County, has been completed for 391 bbl. from Lansing-Kansas City to open new pay zone in area. Eveleigh production is from Arbuckle.

Barton, Russell, Butler, Ellis, and Rice counties, in the order named, monopolized new locations for week with 40 of the state's total of 88. Russell, Barton, Rice and Rooks accounted for 19 of 43 completions in a light week. Only 4 wildcats were included in the 88 locations—one each in Norton, Kiowa, Graham, and Barber.

KANSAS SUCCESSFUL WILDCATS

Barton County: Bennett & Roberts et al Esfield, SE SE NW 15-16s-11w, pumped 138 bbl. of 37°-gravity oil per day from Arbuckle at 3,354-58 ft.; Heebner 2,928 ft., brown lime 3,024 ft., Lansing-Kansas City 3,043 ft., conglomerate 3,332 ft., TD 3,358 ft.

Butler County: Cox & Burns 1 Joseph, NE SE NE 18-24s-5e, pumped 15 bbl. of oil per day from Mississippi chat at 2,491-2,503 ft.; Lansing 1,835 ft., Kansas City 2,113 ft., TD 2,503 ft.

Cowley County: Old well worked over—McLeish & Grallap 1 Doane, NE NE NW 26-33s-6e, pumped 50 bbl. of oil per day from Mississippian at 2,816-18 ft., TD 3,143 ft.

KANSAS WILDCAT FAILURES

Graham County: Bennett & Roberts and Wilcox Oil & Gas 1 Gallentine, NW SW NW 5-6s-23w, dry, TD 4,055 ft., anhydrite 2,044 ft., Heebner 3,578 ft., Lansing-Kansas City 3,813 ft., Basal Kansas City 3,813 ft., Arbuckle 4,015 ft., no shows.

Nadel & Gussman 1 Brobst, NW SW SW 1-6s-21w, dry, TD 3,528 ft., Heebner 3,236 ft., Lansing-Kansas City 3,275 ft., Basal Kansas City 3,470 ft., quartz 3,505 ft., granite 3,522 ft., no shows.

Pratt County: McBride, Carey & Derby Oil Co. 1 McBride, SW SW SE 27-27s-14w, dry, TD 4,656 ft., anhydrite 817 ft., Douglas 3,624 ft., brown lime 3,636 ft., Lansing-Kansas City 3,861 ft., Basal Kansas City 4,192 ft., Mississippian 4,329 ft., Kinderhook 4,375 ft., Viola 4,418 ft., Simpson 4,471 ft., Arbuckle 4,566 ft., no shows.

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ILLINOIS

Passport Pool Outpost Flows on Drill-Stem Test

MATTOON.—J. L. Black 1 Veronica Iffert, C E½ SE NE 11-4n-8e, ½-mile west outpost to Passport pool, Clay County, flowed clean oil in 17 minutes on drill-stem test of McClosky lime at 3,006-13 ft. Casing is being set to test sand.

Indiana Farm Bureau and C. E. Brehm 1 Oliver, NW NE NE 29-7s-8e, has been completed for 33 bbl. of oil in Weinberg at 2,097-112 ft. Well is 1¼-mile southwest outpost of Roland pool, Gallatin County.

Wayne, White, Clay, and Wabash counties led state in completions for week with 11, 6, 6, and 4 respectively which accounted for 27 of state's total of 48. Wayne County was standout in drilling permits granted, accounted for 14 of state's 41. Remaining 28 were widely scattered.

ILLINOIS SUCCESSFUL WILDCAT

Gallatin County: Brehm 1 Oliver et al, NW NE NE 29-7s-8e, 30 bbl. of oil daily, total depth 2,115 ft., shot with 30 qt. 2,098-115 ft., Waltersburg sand pay.

ILLINOIS WILDCAT FAILURES

Clark County: Kuykendall 1 Hammond, NE SE NE 13-11n-14w, dry, total depth 450 ft.

Menhall 1 Daly, NW NW NE 27-9n-11w, dry, total depth 2,659 ft.

Clay County: National Associated and Ashland 1 Sparling, NW NE SE 2-5n-7e, dry, total depth 3,042 ft.

Collins Brothers 1 Colclasure, NE NW NW 26-3n-5e, dry, total depth 2,974 ft.

Edwards County: Hammer 1 Henderson, NW NE NW 17-1s-14w, dry, total depth 3,209 ft.

Greene County: National Associated 1 Barnes et al, SW NE SW 28-6s-8e, dry, total depth 3,068 ft.

Jasper County: Jordan 1 Kerner, SE NW SW 28-7n-10e, dry, total depth 2,811 ft.

Wabash County: Ryan 1 Bricholtz, NE NW SE 4-2s-13w, dry, total depth 2,725 ft.

CALIFORNIA

Cretaceous Test For Fresno County

LOS ANGELES.—Jergins Oil Co. has staked location for a Cretaceous test on the Cheney ranch of Fresno County. The well will be known as the 1 Escarpedo in 32-14s-12w. This venture is of great interest since it may help determine the possibilities of commercial oil production from sands of Cretaceous age in California. Thus far only one small oil field, near Oil City, has produced any appreciable quantity of oil from Cretaceous rocks. Several gas fields in northern California produce from this horizon, but no oil fields. If these older rocks should be found to be productive in commercial quantities in the 1 Escarpedo, large areas of the state which are now unproductive would be opened to further exploration.

The 1 Escarpedo has gained added interest due to the fact that it is located only 5 miles from a well drilled by Jergins on the Cheney ranch in 1942, and completed as an oil well in the Cretaceous. Known as the 1 Cheney Ranch, this previous well was completed for approximately 15 bbl. of oil daily. Although the oil was of extremely high gravity, the well was not considered commercial and subsequently was shut in for several years.

Standard Oil Co. of California has passed the 15,000-ft. depth with their 1 Maxwell in 23-2n-23w, in the Montalvo area of Ventura County, and in so doing has reached the greatest depth ever penetrated in Southern California. The depth record for this part of the state formerly was held by Standard 2-1 Fillmore Community, which was abandoned after going to 14,512 ft. 2 years ago. The 1 Maxwell is located only a few miles from Standard's Oxnard discovery, the 2 McGrath, 25-2n-23w, which was completed earlier this year as the first high-gravity oil producer on the Oxnard plain. Meanwhile, Standard 65-3 McGrath, confirmation test to the discovery, has been redrilled to 9,850 ft. and is now undergoing swab tests. It is reported that results of the swab tests do not look too encouraging.

Russell Havenstrite is beginning work on another deep test on his Lincoln lease on the north flank of Del Valle field. The new test will be located in 16-4n-17w, approximately 508 ft. north and 591 ft. west of the 15 Lincoln, deep-zone discovery which was completed a few months ago at a total depth of 11,865 ft. for an initial flow of approximately 400 bbl. daily.

New locations staked in California during the past week again climbed to a high peak as operators announced locations for 64 new tests, an increase of 18 over the number announced during the previous week. Slated for appreciable quantities of new work were the Huntington Beach field with eight new locations, Kern River and Midway-Sunset with five each, Cymric with four, and Poso Creek and Wilmington with three each.

CALIFORNIA SUCCESSFUL WILDCAT

Monterey County, San Ardo Area: Previous completion—The Texas Co. 1 Lombardi, 27-22s-10e, pumped 84 bbl. daily, gravity 11°, water cut 4 per cent, 7-in. casing 3,133 ft., TD 2,158 ft.

CALIFORNIA WILDCAT FAILURES

Kern County, Ant Hill area: Independent

Pritchard gas engineering services

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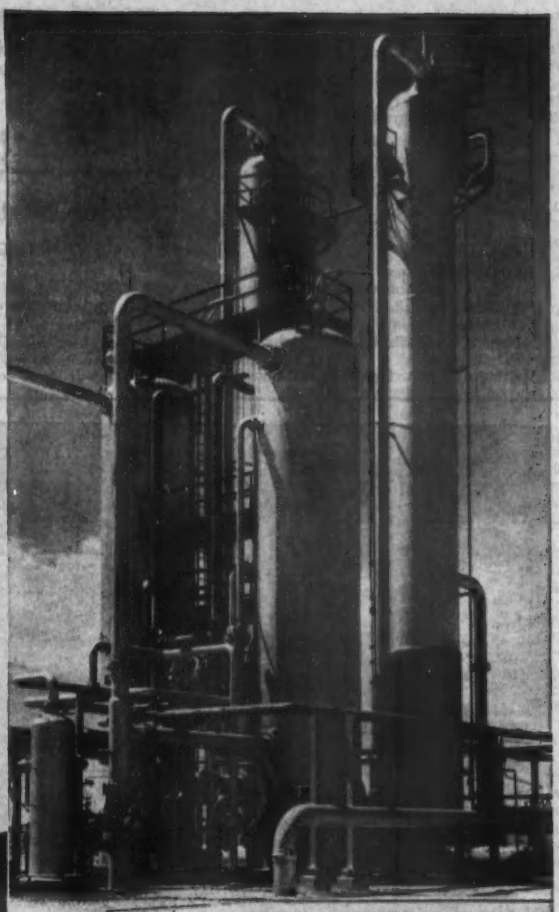

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Exploration Co. 3 Linda, 2-29s-29e, dry, elev. 850 ft., TD 1,244 ft., this well formerly was called Maurer & Fisher 3 Linda.

Sharktooth Area: Previous completion—Barnsdall Oil Co. 1 Bosworth, 8-28s-28e, dry, elev. 1,040 ft., Vedder 3,418 ft., TD 3,435 ft.

Santa Barbara County, Orella Area: Shell Oil Co., Inc., 2-1 Careaga, 36-5n-31w, dry, elev. 273 ft., TD 1,763 ft.

Solano County, Kirby Hills Area: Shell Oil Co., Inc., 6 Lambie, 30-4n-1e, dry, elev. 23 ft., TD 7,896 ft.

San Emigdio area: Apex Petroleum Corp., Ltd., 1 Los Lobos, 5-10s-22w, dry, elev. 1,605 ft., TD 3,505 ft.

South Belridge area: E. A. Parkford 12-1 Belridge, 12-29s-21e, dry, elev. 496 ft., TD 3,500 ft.

Williams area: F. W. Williams 1 Williams, 5-28s-20e, dry, elev. 868 ft., TD 3,098 ft.

Orange County, West Newport area: Honolulu Oil Corp. 1 Holtz, 1-6s-11w, dry, TD 6,492 ft.

PERMIAN BASIN

Jordan Northwest Outpost Gets Silurian Production

MIDLAND.—Silurian production in a 1-mile northwest outpost to the Jordan Ellenburger field of Ector County was reported at Gulf Oil Corp. 20-B-E Connell, Section 26, Block B-16, PSL Survey. A 2-hour drill-stem test at 7,530-80 ft. brought gas to the surface in 5 minutes and oil at the end of 10 minutes. In 1 hour it flowed 110 bbl. of greenish-brown clean oil, testing 42.6° gravity. Gas-oil ratio was 556 cu. ft. Operators were to drill ahead before making further tests.

Slick-Urschel Oil Co. 1 Plymouth et al, deep Upton County wildcat 9 miles northwest of the Big Lake field in Regan County, and near the center of the east line of the county, took a drill-stem test in open hole at 11,908-72 ft. Open 70 minutes, the total recovery was 2,000 ft. of water blanket, 200 ft. of drilling mud, and 30 ft. of drilling mud slightly cut with gas. Previous tests around 11,312 ft. have recovered heavy gas and a spray of distillate. Operators were to run 5-in. casing to bottom and perforate in an attempt for completion. Top of the Ellenburger was 11,201 ft., 8,352 ft. subsea.

In southwestern Ector County, Humble Oil & Refining Co. 1 Earl Vest, Section 17, Block 18, PSL Survey, took a 90-minute drill-stem test in the Ellenburger at 11,560-85 ft., but recovered only water blanket, with no shows of oil or gas. It was shut down for orders. Location is 5 miles northwest of Humble's Yarbrough & Allen Ellenburger discovery.

Sun Oil Co. apparently had found the water table on the west side of its Jameson Strawn field in northwestern Coke County. The 3 Homer H. Jameson took a 45-minute drill-stem test at 6,683-98 ft., recovering the water blanket and drilling mud, 960 ft. of gas-cut mud, and 450 ft. of salt water cut with gas and some oil; the last 180 ft. was clear water. Operators then cored ahead below 6,762 ft. in lime and shale. Location of the 3 Jameson is in the NW NE Section 316, Block 1-A, H&TC Survey, and 2,982 ft. southwest of the 1 H. H. Jameson which is a west offset to the pool discovery.

In Winkler County, Magnolia Petroleum Co. 1-DD Walton, Section 7, Block B-3, PSL Survey, had prospects of extending Ellenburger production about 1 mile southeast of nearest production in the Kermit field. A drill-stem test from 10,495-10,524 ft., open 2 hours and 7 minutes, brought gas to the surface in 31 minutes and recovered 20 ft. of clean oil, plus 80 ft. of oil slightly cut with drilling mud. There was no water. While the 1-DD Walton may extend Kermit Ellenburger production, location of the well is on the west side of Keystone Colby sand field, being deepened from the Colby around 3,695 ft.

New exploration work announced last week included Hunt Oil Co. 1 University, a 12,000-ft. Ellenburger test in Section 14, Block 12, University Land, about 6½ miles south of Big Lake. Hunt will also drill a 2,500-ft. test in the same section. In Andrews County, Cascade Petroleum Co. made location for a 5,200-ft. rotary wildcat, 13 miles south of Andrews. It will be the firm's 1-A University, in Section 33, Block 1-U. Four new operations were reported in Tunstill Delaware sand field, 6 miles northeast of Orla, northeastern Reeves County.

Field oil well completions, by fields were: Andector one, Adair, one, Crossett one, Crockett one, Coleman Ranch one, Dollar Hide one, Doss one, Fullerton four, Fullerton Ellenburger one, Garza three, Howard-Glasscock one, Iatan-East Howard two, Keystone Ellenburger one, Levelland two, McCamey one, McElroy one, Monahans Clear Fork two, Noelke one, Slaughter one, Sharon Ridge two, Toborg four, TXL Devonian, TXL Ellenburger one, Welch two.

WEST TEXAS SUCCESSFUL WILDCATS

Crockett County: Bryd-Frost and Gulf Oil Corp. 1 Mayberry, Sec. 39, Blk. 31, H&TC Sur., discovery of Tippett field, 6 mi. SW Crockett field, flowed 1,391 bbl. 41.6-gravity oil a day, ½-in. choke, GOR 1,300 cu. ft., top Wolfcamp 6,010 ft., top pay 6,306 ft., TD 7,796 ft.

Gaines County: Los Nietos Oil Co. 1 J. A. Sparks, Blk. G, CCSD&RGNG Sur., 12 mi. W Seminole, pumped 155 bbl. fluid a day, cutting 5 per cent salt water, pay 6,860 ft., TD 7,290 ft., PB 6,934 ft., gravity 30.7°.

Runnels County: Southern Minerals Corp. 1 K. V. Northington, T. Pratt Sur., 1½ mi. W Ballinger, pumped 33 bbl. 42°-

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WEST TEXAS WILDCAT FAILURES

Andrews County: Guy Mabee Drilling Co. 1 L. C. Heydrick, Sec. 6, Blk. A-41, PSL Sur., 2½ mi. NW Martin field, dry, TD 10,220 ft., Clear Fork 5,860 ft., Tubb 6,320 ft., Simpson 9,365 ft., Ellenburger 9,970 ft.

Cochran County: Ray A. Albaugh 1 Allie D. Slaughter, Lodge 82, Shackelford CSL Sur., 8 mi. E Morton, dry, TD 4,800 ft., San Andres 3,680 ft., elev. 3,688 ft.

Ector County: Sunray Oil Co. 1 J. E. Parker, Sec. 10, Blk. 44, T&P Sur., 2 mi. N Harper field, dry, TD 10,191 ft., Yates 2,730 ft., San Andres 4,180 ft., Glorietta 5,240 ft.

Pecos County: G. T. Abell 1 Dietrich-Eager, Sec. 20, Blk. 2, H&TC Sur., near Buena Vista townsite, dry, TD 5,400 ft., Yates 1,320 ft., San Andres 2,380 ft., Devonian 5,020 ft., elev. 2,388 ft.

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SOUTHEAST NEW MEXICO

HOBBS.—A 2-mile south extension to the Loco Hills field of northeastern Eddy County was completed as a 75-bbl. well, the Harvey Yates (formerly Stroup and Yates) 3-B Ballard, 8-18s-29e, deepened from dry limestone at 2,485 ft. to 2,620 ft. where it found 40 ft. of limestone pay section, was shot with nitro from 2,617-34 ft. In northeast Lea County, Mid-Continent Petroleum Corp. 1-A Sawyer, 27-9s-36e, was drilling below 8,219 ft. in dolomite sand and shale.

In the Monument area, several deep tests are under way to test the Ellenburger. Barnsdall Oil Co. 9 Alaska Cooper, 12-20s-36e, was below 5,690 ft. in limestone; a drill-stem test at 5,630-75 ft. recovered 75 ft. of drilling mud with no shows. Amerada Petroleum Corp. 5 Phillips, 1-20s-36e, was testing at 9,953 ft. in the Ellenburger but details were withheld. Amerada's 2 Record, 24-19s-35e, was drilling below 9,365 ft.

SOUTHEAST NEW MEXICO WILDCAT FAILURE

Chaves County: George Turner 1 State, 21-20s-28e, 2 mi. W Russell field, dry, TD 922 ft. in sand, Brown lime 816 ft.

EASTERN TEXAS

Oil Found On SE Flank Of Carthage Gas Field

DALLAS.—A dual completion, in the Travis Peak and Lower Pettit zones, established crude-oil production on the southeastern flank of Carthage gas field in Panola County. Sun Oil Co. (originally started by Rogers Lacy) 1 Mrs. Lela Smith, in the S. M. C. Hooker Survey, 5 miles southwest of Deadwood, and approximately 9 miles southeast of the town of Carthage, made completion potentials of slightly more than 234 bbl. of oil from each pay. In the Lower Pettit, perforations were at 5,902-14 ft., and in 22 hours, flowing through ¼-in. tubing choke, it gaged 215 bbl. of 43.8°-gravity oil. Tubing pressure ranged from 300-360 psi., and gas-oil ratio was 671 cu. ft. Travis Peak perforations were between 6,086-94 ft., and in 18 hours, through ¼-in. choke, the flow was 177.58 bbl. of 42.6°-gravity oil. Tubing pressure was 325 psi., and gas-oil ratio was 823 cu. ft.

Commercial oil production on this flank will greatly spur drilling, as many operators have been of the opinion that eventually the Carthage gas area would connect with the Joaquin and Logansport area some 15 miles to the southeast. Rogers Lacy was reported to have staked a north offset location. The 1 Smith is generally considered a discovery, although about six wells in the field have some production in the Travis Peak, and one well has Lower Pettit production, according to Texas Railroad Commission reports.

On the southwest edge of Bazette field, northeast Navarro County, W. W. Lechner 2-D W. J. Trammel completed for 153 bbl of 44°-gravity oil a day, through ¼-in. choke, in the Woodbine at 2,986-90 ft. The flowing well is expected to revive activity at Bazette, which was discovered in 1939.

East Texas wildcat operations held a steady pace last week, but no important changes were reported. In Smith County, Magnolia Petroleum Co. 1 R. W. Fair, north of Mount Sylvan, was drilling below 9,112 ft. in shale and anhydrite. It had the first anhydrite stringer at 8,520-30 ft., and the second at 8,840-50 ft., both by samples, and logged top of the Massive anhydrite at 9,100 ft.

In Cass County, 5½ miles southeast of Atlanta, Ark-La Oil Corp. 1 Brooks was drilling below 7,068 ft. in shale, with streaks of sand. It logged the Travis Peak at 6,900 ft. Two miles west of Bloomburg, Shell Oil Co., Inc., 1 Gerald Smith, had no shows in red beds and shale at 7,928 ft.

In Hunt County, 2 miles southeast of Dixon, Hunt Oil Co. 1 Naud Burnett, logged the Georgetown limestone at 3,748 ft., on an elevation of 502 ft. and placed sample tops on the Woodbine sand at 3,040-50 ft., and red beds 3,063-73 ft. Operators continued drilling below 4,268 ft. W. B. Hinton 1 Thornton, Henderson County test 6½ miles south of Malakoff, was drilling below 6,008 ft. in shale, with no shows. Shell 1 F. E. Lumpkin, 4 miles southwest of Cedarville, was drilling in sandy limestone at 7,193 ft. Three miles west of San Augustine, D. H. Byrd 1 Blount was drilling below 6,337 ft. in shale and limestone. In Rains County, Bobby Manziel 1 Grimes, 6½ miles southeast of Emory, was below 6,221 ft. in shale and limestone. Sample tops reported were: Georgetown limestone 5,290 ft., Comanchean limestone 5,300-10 ft.

New locations reported last week totaled 24. By counties, they were: Anderson three, Cherokee one, Freestone 1, Harrison one, Henderson two, Hopkins one, Houston two, Leon one, Limestone one, Marion three, Navarro two, Smith three, and Wood three.

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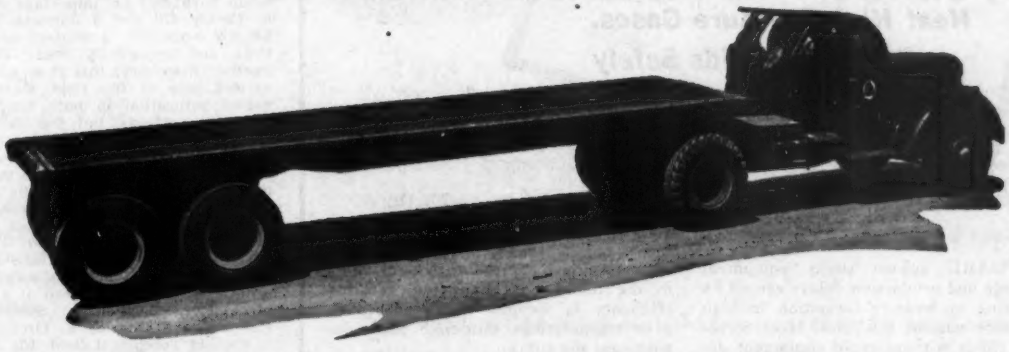

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In Hopkins County, Delta Drilling Co. will drill its first offset test to the discovery of the Como (Sub-Clarksville sand), four miles southeast of Reilly Springs. The new test will be the 1 Ruth Starr Blake, Nacogdoches University Survey, and 1,900 ft. southeast of the discovery. In Houston County, location has been made for a test 2 miles southeast of Crockett, to be drilled by Daniel Peterkin, Jr., as the 1 H. F. Moore, Jr., on a 135-acre tract in the Henry Masters Survey. It will test the Woodbine to 7,850 ft. In Anderson County, The Texas Co. 1 J. B. Barnard, Block 3, Rinehart Survey, will be a first outpost test to Blackfoot field, and about 1 mile northeast of Sanders & Murchison's discovery, which produces from the Pettit near 9,800 ft.

Field oil well completions were: Cayuga two, Whelan one distillate, Huxley one distillate, Joaquin one gas, Norman Paul five, Merigale one.

EAST TEXAS SUCCESSFUL WILDCATS

Grayson County: Standard Oil Co. of Texas 1 H. L. Rising, J. B. McNair Sur., 2 mi. N Sherman, pumped 116 bbl. 36°-gravity oil a day, GOR 390 cu. ft., sand 3,261-64 ft., TD.

EAST TEXAS WILDAT FAILURES

Denton County: The Texas Co. 1 Fred Freeman, J. Ayers Sur., 4½ mi. S Sanger, dry, TD 2,538 ft.

Henderson County: Ralph E. Fair, Inc. 1 TP&L, N. Addison Sur., Trinidad area, dry, TD 8,008 ft., sample tops: Woodbine 3,800 ft., Austin 4,615 ft., Paluxy 5,674 ft., Glen Rose 5,848 ft., Massive anhydrite 6,868 ft., Pettit 7,570 ft., Travis Peak 7,715 ft., elev. 307 ft.

Limestone County: W. L. Hernstadt 1 Barron, W. G. McKenzie Sur., 6 mi. SW Groesbeck, dry, TD 9,132 ft., Austin 2,945 ft., Edwards porosity 4,014 ft., Massive anhydrite 5,332-82 ft., Travis Peak 6,042 ft., Buckner 7,810 ft., by samples.

Milam County: T. Y. McCormick 1 J. S. Jacobs, Jose Leal Sur., 2 mi. E Minerva, dry, TD 1,462 ft., gas sand 1,090-1,108 ft., oil showing 1,108-15 ft.

Smith County: W. W. Bradley 1 C. C. Aaron, D. Wilson Sur., 2½ mi. N Jamestown, dry, TD 5,398 ft. in Woodbine, no tops reported.

Van Zandt County: R. W. Fair 1 M. Swinney, Wm. Maguire Sur., 3 mi. W Van field, dry, TD 3,718 ft., Austin 3,065 ft., Woodbine 3,555 ft., by samples.

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ROCKY MOUNTAIN

Amsden Pay Shows For Oil in Lost Soldier

DENVER.—A discovery of far reaching importance is indicated in Sinclair-Wyoming Oil Co. 77-A Unit, SE NE NE 10-26n-90w, Lost Soldier field, Sweetwater County, Wyoming. This well, which was completed for 1,100 bbl. in the Tensleep sand in 1939, started deepening to the Madison 2 weeks ago. It topped the Amsden sand, which lies below the Tensleep and above the Madison, at 4,625 ft., and in a drill-stem test at 4,622-76 ft., through ¼-in. choke, open 30 minutes, recovered 546 ft. of 34.7°-gravity oil, 591 ft. of oil cutting 30 per cent mud, and 46 ft. of mud. Another drill-stem test at 4,675-4,733 ft. through a ¼-in. choke, open 30 minutes, recovered 1,335 ft. of 35.7°-gravity oil and 30 ft. of mud. Top of saturation was at 4,640 ft. A last named depth of 4,733 ft. it was believed to be close to the top of the objective Madison, but at that point it was made a tight hole and no further information has been released. This is the first test of the Madison to be drilled in a producing field on the Wertz-Mahoney-Ferris anticline and portends important developments on several of the large producing structures in that area. Lost Soldier, which is on the west end of the anticline, was discovered in 1916, the first well making 200 bbl. per day from the Wall Creek sand at 265-340 ft. Since then 11 producing sands have been developed at depths ranging from 195 to 4,000 ft., the deepest being the Tensleep.

Elk Basin area.—The Elk Basin field again furnishes an important development in Carter Oil Co. 8 Johnson-Watson, NE SE SW 8-57n-99w, a wildcat outside of the Unit, and apparently ready to chalk up another discovery, this time on the southeastern side of the field. Cores have revealed saturation in both the Embar and Tensleep horizons, but the well is headed for a test of the Madison.

The well is located apparently on the east side of a southwest-northeast trending fault, and is ¾ mile south of the nearest Tensleep producer in Elk Basin proper. Also, it is 1½ miles north of the nearest Tensleep producer in South Elk Basin.

Torchlight discovery.—Clark Drilling Co. 1 Unit, SW SE NE 24-51n-93w, which opened a new pay in the Tensleep at a total depth of 3,140 ft., located on Stanolind Oil & Gas Co. and Charles E. Orchard acreage in the old Torchlight field, Big Horn County, Wyoming, flowed 1,632 bbl. of 35.2°-gravity oil on final test. Another well will be drilled to test the Madison, the original objective in the discovery.

Mush Creek area.—The Mush Creek area in Weston County, northeastern Wyoming, along the eastern edge of the Powder River Basin, is spreading out. Morton Oil Co.-Morton Drilling Co. 2 Michaels, NE NW NE 26-44n-63w, looks like an important extension. It had the top of the Newcastle at 3,872 ft., and drilled to 3,896 ft., where it stopped to run casing to the top of the pay. Phillips Petroleum-Morton-Torgeson 1 Torgeson, C NW SE 7-44n-63w, pumped 23 bbl. in 16 hours at a total depth of 4,335 ft. It had the top of the pay at 4,254 ft. The sand is reported to have contained considerable shale and bentonite and to have had less reservoir capacity than expected. Phillips Petroleum Co. 2 Weston, SE SE SE 8-44n-63w, started flowing at 4,215 ft., but no gage was taken. Texas Co. is the latest major to enter the

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field, and has spotted its 1 Updike, NW SW NE 21-44n-63w.

Powder River Basin wildcat.—Texas Co. 1 Unit, NW NE 2-52n-72w, Adon structure, Campbell County, Wyoming, is drilling in chert at 9,372 ft., and reports no additional shows. A drill-stem test in the Converse sand (Pennsylvanian) at 9,006-17 ft. had 2,000 ft. of oil and 3,100 ft. of water in 1 hour.

New operations.—Nineteen new operations were reported, of which 4 were in Colorado, 11 in Wyoming, and 4 in Montana. One of the Colorado locations was in the Rangely field, and the other three were wildcats, as follows: Dan W. McLaughlin 1 Anderson, NE NE SW 17-31s-61w, Las Animas County; C. L. Price 1 Government, SW NE 24-5n-94w, West Axial, Moffat County, an old well drilling deeper from 2,317 ft.; Leon Wandra 1 Neigh, NW NE SE 19-24s-65w, Granerous area, contract to Rickey Drilling Co. Wyoming had 2 locations in Torchlight and 1 each in West Mule Creek, Quealy, East Lance Creek, Frannie, Mush Creek, and Salt Creek, and 3 wildcats. One of the wildcats is a deep test out in the Big Horn Basin, Stanolind Oil & Gas Co. 1 Unit, SE NE 8-55n-100w, Big Sand Coulee, Park County. Another wildcat is General Petroleum Corp. 81-7-G in Section 7-28n-113w, Tip Top structure, Sublette County. The third wildcat is D. O. Gray and G. Cannon 1 Howell, C NW NW 4-43n-61w, Bucktail area, Weston County, 12 miles east of Mush Creek. Montana locations included 3 in Cut Bank and 1 in the Cedar Creek gas field.

Completions.—Twenty-one wells were completed, of which 14 were oil wells, 2 were gas wells, and 5 were dry holes. Only completion in Colorado was a development well in Rangely. Wyoming had 9 completions, 6 oil and 3 dry holes. These included 1 each in Grass Creek, Steamboat Butte, Frannie, Hidden Dome, and Mush Creek, and 4 wildcats. Montana had 10 completions, 7 oil, 2 gas, and 1 dry. Utah had one wildcat failure.

WYOMING SUCCESSFUL WILDCAT

Torchlight, Big Horn County: Clark Drilling Co. 1 Unit (Stanolind-Orchard), SW SE NE 24-51n-93w, TD 3,140 ft., flowed 1,632 bbl. 35-2° gravity from Tensleep in 24 hours. Discovery in deeper pay. Dakota 1,170, Chugwater 1,965, Phosphoria 2,815, Tensleep 3,045, 7-in. 3,038 ft., elev. 4,100 KB.

WYOMING WILDCAT FAILURES

Pacific Creek, Sublette County: Superior Oil Co. 1 Unit, SW NE SW 27-27n-103w, TD 9,881 ft., in Mesa Verde, top 8,434 ft., several uncommercial shows in Tertiary sands. Ground elev. 7,072 ft.

Castle Creek, Natrona County: Oil Inc. 2 Government-Davis, NW NW NE 24-38n-81w, TD 3,501 ft. OWDD from 2,318 ft. 1st Wall Creek 1,768 ft., 2nd. Wall Creek 2,112, 3rd. Wall Creek 2,221 ft., Temp. abd.

Lovell, Big Horn County: W. O. Taylor 1 Jolly, NE NE NE 12-56n-96w, TD 300 ft., no test, abd. upon making deal for another location following shooting by Texas Co.

MONTANA SUCCESSFUL WILDCAT

Flat Coulee, Liberty County: A. B. Cobb & Co. 1 Millen, NW NE NW 15-37n-5e, TD 1,785 ft. Top Colorado 645 ft., 4,700,000 cu. ft. of gas, sand not identified.

UTAH WILDCAT FAILURE

Vernal, Uintah County: Carter Oil Co. 1 Knudson, C SW NE 18-5s-21e, TD 6,012 ft., dry and abd., formations not reported, several shows of non-commercial oil and gas in upper horizons.

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CANADIAN FIELDS

Westlock Test Finds Devonian Porosity

CHATHAM.—In the Westlock area, 40 miles north of Edmonton, almost due north of Leduc, Westlock Petroleums 1, LSD 14, 14-59-26w4, got the Devonian high, and has encountered porosity around 3,962 ft. after drilling through a green shale. The horizon is believed to correspond to the D-3 zone of the Leduc field. Casing is being run to overcome caving.

St. Paul.—In the St. Paul area in northern Alberta, St. Paul Syndicate 2, LSD 15, 4-58-9w4, has shut down at 1,601 ft., after drilling a heavily saturated oil sand in the Cretaceous at 1,579-78 ft. It will be placed on production next spring. Oil is similar to the Lloydminster product, but a little lighter. St. Paul Syndicate 1, LSD 10, 4-58-9w4, finished at 1,578 ft., has a dry gas flow, estimated 4,000,000 cu. ft. from the same horizon. The gas will be piped to the town of St. Paul for distribution. Additional drilling will be undertaken in the spring.

Jumping Pound.—In the Jumping Pound field, in the southern foothills west of Calgary, Shell Exploration 5-7-1, LSD 5, 7-25-4w5, finished as a gasser in the Madison limestone at 10,200 ft., is continuing bottom-hole pressure tests. Recent flow tests showed up to 24,000,000 cu. ft. wet gas daily, with naphtha recovery around 240 bbl.

Leduc.—In the Leduc field, East Leduc-South Brazeau 1, LSD 3, 9-50-26w4, bottoming at 5,412 ft., is flowing with a substantial but undetermined production from the D-3 zone, contacted at 5,403 ft. Location extends the field ¼ mile south of Imperial 2 producer. East Leduc, LSD 10, 5-51-25w4, outpost test to the north and east, is below 3,439 ft. Globe-Leduc West 3, LSD 10, 34-50-26w4, is coring below 5,180 ft. for an early completion.

Home-Leduc 1, LSD 11, 21-50-26w4, testing between 5,000-56 ft., developed a 2,200-

ft. rise of oil in less than an hour, with initial production estimated around 40 bbl. an hour; and is deepening in green shale below 5,116 ft. for the D-3 zone. Atlantic Oils 1, LSD 13, 23-50-26w4, at 5,338 ft., has set casing in the second porous and is swabbing. Atlantic 2 is a location in LSD 14, 23-50-26w4, and Atlantic 3 in LSD 12, ¼ mile south of No. 1. Continental 1 has moved location to LSD 2, 9-50-26w4, offsetting East Leduc-South Brazeau 1 producer.

Imperial 19, LSD 16, 21-50-26w4, finished at 5,060 ft., kicked off at 366 bbl. through tubing with 70 psi. on the separator. Imperial 17, LSD 16, 16-50-26w4, on drill-stem test at 5,050-5,125 ft. gave 50,000 cu. ft. gas and a rise of 1,000 ft. of oil-cut mud. Imperial 20, LSD 3, 34-50-26w4, is drilling lime below 4,767 ft. Two other Imperial tests are drilling at depth, two new tests spudded and a third rigging.

OKLAHOMA

Southern Ceres Pool Extended 1 Mile South

SOUTHEAST Ceres pool, Noble County, has been extended 1 mile south by B. B. Blair 1 Murphy, NE SE NE 26-23n-1w, which flowed 860 bbl. in 16 hours through open casing. Test topped Bartlesville sand at 4,371 ft. and casing was set at 4,377 ft. Total depth is 4,419 ft. Well is due south of Texas Co. dry hole.

Blackwell Oil & Gas Co. 1 Ball, SE SW SW 33-17n-1e, northwest offset to discovery well of Northwest Iconium field, Logan County, has indicated good production on 50-minute drill-stem test at 5,209-34 ft. Well showed gas in 5 minutes and began flowing after 1,000 ft. of pipe had been pulled. After being shut in for 24 hours an estimated 4,100 ft. of oil was in pipe.

Jordan Petroleum Co. 1 Shutt, C SW NE 13-25n-12w, Alfalfa County wildcat, had show of oil in Mississippi which was topped at 5,848 ft. Drill-stem test at 5,861-80 ft. recovered 30 ft. of mud.

Carter Oil Co. 1 Woolridge, C SW NE 4-4n-3w, north offset to discovery well of Southeast New Hope pool, Garfield County, flowed oil in 90 minutes on 3-hour drill-stem test at 7,214-54 ft. Test flowed 30 bbl. of 40.5 gravity oil in 2 hours through ½-in. choke.

Zephyr Drilling Co. 1 Banning, NE SE SE 36-9n-1e, Cleveland County wildcat, ran 1-hour drill-stem test of Hunton at 5,381-408 ft. recovering 200 ft. of mud, 350 ft. of oil-cut mud, and 150-200 ft. of water.

Cotton County registered 28 new locations for week to hold leading position and to emphasize drilling boom in southern Oklahoma. Other leaders were Carter, Garvin, Okfuskee, Seminole, and Stephens, which together with Cotton accounted for 63 of the state's locations. The same group had 34 of 75 completions recorded for week. Cotton County was again the pace-setter with 13. Wildcat locations were scattered with 11 recorded.

OKLAHOMA SUCCESSFUL WILDCATS

Cotton County: Bridwell 1 Witt, NE SW NW 17-4s-10w, produced 8 bbl. of oil per day from 1,252-57 ft., TD 1,259 ft.

Garvin County: Gulf 1 Hamilton, NW SE SW 11-3n-2w, flowed 194 bbl. of oil per day from Bromide at 5,764-88 ft., TD 6,194 ft.

Wagoner County: Petty 1 Steil, SW SE SE 10-16n-18e, produced 5,000,000 cu. ft. of gas from Tyner at 750-86 ft.; TD 1,000 ft.

OKLAHOMA WILDCAT FAILURES

Cotton County: G. R. & Q. 1 Michael, NW NW SW 21-3s-10w, dry, TD 1,825 ft.

Summers 1 Che-So-Ny, NW NW NE 30-3s-11w, dry, TD 2,020 ft.

Creek County: Buell 1 Moore, NE NE NW 9.14n-8e, dry, TD 3,890 ft.

Garvin County: Crofton 1 Thomson, SW SE NW 8-3n-1w, dry, TD 5,200 ft.

Kiowa County: Gallicote 1-A Braum, SW SW SW 36-6n-18w, dry, TD 836 ft.

Lincoln County: Four States 1 Boyda, SW SE SW 30-13n-6e, dry, TD 4,630 ft.

Hubbell 1 Massey, SW SW NW 9-14n-6e, dry, TD 3,206 ft.

Duncan 1 Westfall, SE SE SE -18-16n-3e, dry, TD 5,082 ft.

Major County: Superior 1 Holland, NE NE NE 17-22n-10w, dry, TD 6,970 ft.

Okfuskee County: Vierson 1 Pharoah, NW NE SW 11-12n-11e, dry, TD 2,602 ft.

Oklahoma County: Double R Drilling 1 Arthur, SE SE SE 22-14n-1e, dry, TD 5,701 ft.

Starr et al 1 Beland, C NW SE 13-11n-1w, dry, TD 6,796 ft.

Harper-Turner 1 Boyd, C SE NW 28-12n-2w, dry, TD 6,563 ft.

Pottawatomie County: Pace 1 Crossland, C NE SW 4-9n-2e, dry, TD 6,159 ft.

Roger Mills County: Bolin & Boren et al 1 Carey, SE SW NW 2-13n-26w, dry, TD 3,035 ft.

Stephens County: Skelly 1 Von Weise, NE NW SE 10-2s-4w, dry, TD 5,635 ft.

OHIO, KENTUCKY

Wayne County Gets Flowing Oil Well

COLUMBUS.—A flowing oil well was struck while drilling for gas in the field south of West Salem. The Ohio Fuel 1 Alice Kline, Section 19, Congress Township, Wayne County, gaged 327,000 cu. ft. in the upper Clinton at 2,359-67 ft. and when 6 ft. in the lower sand, topped at 2,981 ft., the well flowed 50 bbl. in 23 hours. Tanks will be set before drilling on through the sand.

John Morrow et al verified the existence of a gas pool in southwestern Tiverton Township, Coshocton County, when they moved ½ mile north of a small well completed in 1936 and found 575,000 cu. ft. gas at 7 ft. in the second Clinton. The completion was on Walter Styers, Lot 21, and logged a dry sand at 2,961-84 ft., and the top of the pay sand at 2,999 ft.

The Middle Wellington pool was extended ⅛ mile to the east by the Ohio Fuel 1 Chas. Bligh, Lot 3, Penfield Township, Lorain County. Upper Clinton at 2,412-27 ft. gaged 4,460,000 cu. ft. natural.

B. G. Bartley et al 2 Ethel Hoover, Section 22, Madison Township, Perry County, reached the Clinton at 3,311 ft. and when drilled 33 ft. in, had an open flow of 2,500,000 cu. ft. The well also had a show of oil and will be tested before drilling deeper.

The Ohio Fuel 1 Dora Jadwin, Section 26, York Township, Morgan County, found the Clinton, 3,861-98 ft., dry, and the Medina sand, 3,975-81 ft., having a natural gage of 713,000 cu. ft. of gas. The well will be tubed at this depth without shooting.

Ten locations were reported in Perry County, reflecting the increasing activity in the Sego and Sayre pools. In addition, 21 locations reported in 10 other counties. Completions continue at the increased rate with 29 for the week.

OHIO SUCCESSFUL WILDCAT

Ashland County, Ruggles Township: E. A. Fierbaugh et al 1 M. E. Clouser, Lot 24, Clinton 2,455-58 ft., 260,000 cu. ft. gas, Trenton 3,815-4,433 ft., St. Peter 4,454-4,503 ft., TD 4,504 ft., plugged back to 2,466 ft., completed as gas well.

OHIO WILDCAT FAILURE

Cuyahoga County, Solon Township: W. Hoey et al 1 Emma Glover, Lot 7, Clinton 3,610-92 ft., TD 3,700 ft.

WESTERN KENTUCKY

OWENSBORO.—Webster County has six wildcats currently active, but only one has reached possible pay sand depths. Nash Redwine 1 E. T. Melton, 24-M-22, 2½ miles southwest Dixon, got 2,000 ft. of water on 1 hour drill-stem test of Weinberg at 2,422-75 ft.

George S. Engle has 3 wells in the completion stage in Slaughters pool for the pool's only activity.

EASTERN KENTUCKY ACTIVITIES

ASHLAND.—Activities were quiet in the Eastern Kentucky field of operations during the week, with only one completion noted. Kentucky-West Virginia Gas Co. completed Well No. 863 on the Fields Maynard property, Pike County, at 3,150 ft. total depth for 73,000 cu. ft. in shale and Big lime.

New locations were noted in Well 5781, Elbert Minnix, and 5782 Harrison Cole, both in Magoffin County, and 882 George Maynard, Pike County.

INDIANA

EVANSVILLE.—Joe Reznik 1 W. F. Feil, SW SW SW 28-4s-10w, wildcat 11¼ miles north of Evansville, Vanderburgh County, has found excellent oil saturation in O'Hara lime at 2,210-14 ft. One-hour drill-stem test at 2,209-14 ft. got gas in 46 minutes, 1,820 ft. of clean oil, and 30 ft. of muddy oil. Well is 12 miles from any other recent discoveries and 6 miles from old shallow Pennsylvania sand wells along U. S. Highway 41.

Joe Reznik 1 M. and C. Weber, NE SE SE 30-2s-9w, wildcat 2 miles southwest of Francisco, Gibson County, is testing Lower Renault lime at 1,819-23 ft. and McClosky at 1,849-53 ft. One-hour drill-stem test of Lower Renault got 720 ft. of gas and 200 ft. of oil. Half-hour test of McClosky got 25 ft. oil-cut mud.

LEGAL

15,138.59 acres of Tribal and Allotted Indian lands located in Townships 1 South, Range 1 East, 1 South, 2 Range East, 2 South, Range 1 East, in the Uintah and Ouray Reservation, Utah, are being advertised for lease, bids on which will be opened December 18, 1947, at 2:00 P.M., at the office of Forrest R. Stone, Superintendent Uintah and Ouray Agency, Fort Duchesne, Utah. Full descriptions may be obtained from Superintendent Stone, or from Supervisor J. R. Schwabrow, U. S. Geological Survey, Federal Building, Casper, Wyoming.

LEGAL

CALL FOR BIDS. To sell royalty crude oil accruing to the United States. Sealed bids, in duplicate, will be received in the office of the Director of the Geological Survey, Room 5244 Federal Works Agency Building, Washington 25, D.C., on or before noon, December 4, 1947, and publicly opened at 2:00 p.m., on that day, for the sale of certain royalty crude oil accruing to the United States from Federal lands in the Cat Creek field, Montana; the La Barge, Rock Creek, and South Elk Basin fields, Wyoming; and the Elk Basin field, Wyoming and Montana. No bids received after the time fixed herein for submitting bids will be considered. Contracts for the royalty oil will be for a term of 3 years beginning the first day of the calendar month following execution by the Secretary of the Interior. The monthly royalty oil accruals offered for sale under seven items are approximately as follows: 3,200 barrels from the Cat Creek field; 4,200 barrels from the La Barge field, 1,600 barrels from the Rock Creek field, 3,000 barrels from the South Elk Basin field; and 45,000 barrels from the Elk Basin field. Specifications on the quantities of crude oil offered for sale, the form of bids, the form of contract, and the conditions with respect to bond requirements, deliveries, volume measurements, gravity determinations, and other details relating to the call for bids may be obtained from the Director, Geological Survey, U.S. Department of the Interior, Washington 25, D.C., or the Oil and Gas Supervisor, U.S. Geological Survey, P.O. Box 400 (305 Federal Building), Casper, Wyoming. Sealed bids must be submitted to the Director of the Geological Survey, U.S. Department of the Interior, Washington 25, D.C., pursuant to the specifications, the envelope to be marked plainly "Bid on Royalty Oil, not to be opened before noon, December 4, 1947." C. Girard Davidson, Acting Secretary of the Interior.

Well Completions in October Resumed Upward Trend

THE number of new wells completed during October totaled 3,265, an increase of 441 completions over September, but 122 short of the all-time high of 3,387 established in July of this year.

October completions of oil and gas producers increased 238 and 50 respectively over September, but dry holes also increased in proportion; rigs and drilling operations continued their steady climb. Average depth at 3,299 ft. shows a slight increase over 3,290 ft. in September Percentagewise the 1,000-2,500-ft. and the 2,500-5,000-ft. groups showed the biggest increase for the month. Considering the number of active deep areas, this probably reflects the shortage of pipe, and the tendency of the operators to use their available pipe to drill two shallow holes instead of one deep well. It also reflects the unwillingness of operators to start deep wells until all the pipe required is on hand or definitely in sight.

The eastern states of New York, Pennsylvania, and West Virginia account for 101 wells of the total October increase of 441. The northeast central region, including Ohio, Indiana, Kentucky, Michigan, and Illinois, had a net gain of 30 completions for the month; the Mid-Continent area, Oklahoma-Kansas, and the Nebraska-Missouri-Iowa area, had the biggest gain over September, 195 more wells. Texas-New Mexico had an increase of only 27, while the southern area including Arkansas, Louisiana, Mississippi, and Alabama-Georgia-Florida, jumped 59 wells, or nearly 30 per cent. California stepped up its completions 30, and the Rocky Mountain area had the only decrease, 1 well less.

Gains Over Previous Year

Comparing results with October of last year, total completions increased 20.4 per cent, made up of a 22.1 per cent increase in oil wells, 2.4 per cent increase in gassers, and 24.3 per cent in dry holes. Here again the effect of the pipe shortage is noticeable, as the greatest percentage increases were in the 0-1,000 ft., and 2,500-5,000-ft. groups. The 5,000-10,000-ft. and "over 10,000-ft." groups showed increases of only about two-thirds as much as the average. Active operations as reflected in the rigs and drilling figures show an increase of slightly under 16 per cent. It is not likely, however, that future completions will fail to exceed the corresponding months last year by figures greater than that. This seems to result from greater drilling efficiency, in spite of handicaps from pipe shortages.

In comparing increases in October with the same month last year, the southern area of Louisiana-Arkansas, Mississippi et al stands out with an increase of 50 per cent in completions, 269 compared to 179. California stands practically on a par with this group, its 70 increase accounting for a jump from 143 wells last year to 213 this October. The Oklahoma-Kansas group accounted for the greatest numerical increase with a gain of 157 wells, which was also a healthy percentage jump, 724 completions this year compared to 567 last October.

The eastern states of Pennsylvania, New York, and West Virginia showed a gain of 119 wells, from 499 last year to 618 this year. Although the Rocky Mountain area showed a loss from September to October this year, comparing October 1947 to October last year, its 75 wells compare with 57 then, an increase of 18, or better than 30 per cent. Texas-New Mexico, with the greatest number of completions, was able to increase only about 10 per cent this year, 807 versus 735. The northeast central region of Ohio, Indiana, Kentucky, Michigan, and Illinois increased 28 wells, from 531 to 559, despite continued reports that nothing new of importance is being found and that drilling can be expected to decline for lack of locations to drill.

SUMMARY OF COMPLETIONS, OCTOBER 1947

	Comp.	Oil	Prod.	Gas	Dry	Under 1,000 ft.	1,000-2,500 ft.	2,500-5,000 ft.	5,000-10,000 ft.	Over 10,000 ft.	Total footage	Rigs and drilling
New York	180	90	194	0	[1]90	0	180	0	0	0	252,017	168
Pennsylvania	333	169	367	29	[2]135	0	0	333	0	0	520,283	262
West Virginia	105	20	271	60	25	3	57	42	3	0	258,665	241
Ohio	130	36	1,219	44	[3]50	11	43	76	0	0	355,098	257
Indiana	57	22	1,011	2	33	11	36	10	0	0	98,993	73
Kentucky	70	37	3,074	6	27	18	27	25	0	0	130,666	84
Illinois	191	95	10,882	1	95	12	54	125	0	0	487,610	237
Michigan	111	43	16,125	7	[4]61	1	78	34	0	0	237,712	149
Kansas	329	155	74,137	63	[5]111	2	31	293	3	0	1,063,614	375
Neb., Mo., Iowa	1	0	0	0	1	0	1	0	0	0	1,601	10
Oklahoma	[7]394	205	22,786	37	[6]152	10	128	186	66	4	1,340,225	541
Texas	764	473	94,728	45	246	48	153	310	234	19	3,338,817	1,125
North	[7]140	79	8,624	1	60	13	66	46	15	0	367,331	171
West Central	74	28	3,090	6	40	8	21	41	4	0	218,508	96
West	187	164	60,066	0	23	15	24	86	54	8	911,450	208
Panhandle	43	23	2,477	17	3	0	3	39	1	0	131,237	123
Eastern	[8]55	27	3,082	7	21	0	8	27	19	1	258,783	107
Gulf Coast	[9]124	78	9,710	8	38	0	6	34	74	10	756,452	213
Southwest	[10]141	74	7,679	6	61	12	25	37	67	0	695,056	207
Louisiana	176	125	17,132	13	38	2	84	25	45	20	856,870	249
Northern	[11]126	87	10,683	13	26	2	84	21	17	2	378,974	100
Southern	[12]50	38	6,449	0	12	0	0	4	28	18	477,896	149
Arkansas	[8]42	21	3,146	2	19	0	2	37	3	0	158,446	47
Mississippi	[8]43	28	8,711	3	12	0	0	7	24	12	364,948	105
Ala., Ga., Fla.	8	1	120	0	7	0	0	4	3	1	47,288	17
Montana	31	12	1,126	11	8	4	22	5	0	0	55,647	97
Wyoming	28	16	4,276	2	10	2	3	15	7	1	123,092	116
Colorado-Utah	16	13	2,239	2	1	2	0	1	13	0	88,759	93
New Mexico	43	28	8,951	8	7	0	4	22	17	0	197,605	131
California	213	171	31,860	4	38	15	66	79	47	6	794,641	341
Total October 1947	3,265	1,760	302,355	339	1,166	141	967	1,629	465	63	10,772,599	4,718
Total September 1947	2,824	1,522	240,937	289	1,013	161	786	1,387	430	60	9,289,820	4,486
Total October 1946	2,711	1,442	238,222	331	938	105	1,052	1,094	405	55	8,911,984	4,077

Service wells included: [1]90, [2]132, [3]12, [4]11, [5]2, [6]6. Distillate wells included: [7]2, [8]1, [9]3, [10]4, [11]5, [12]8.

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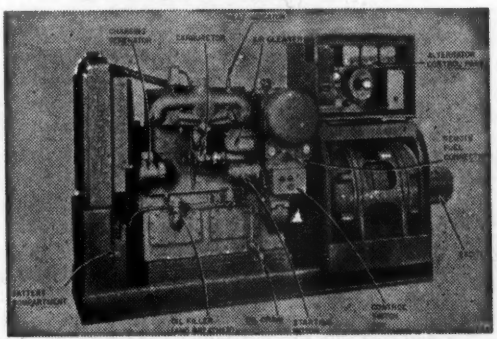

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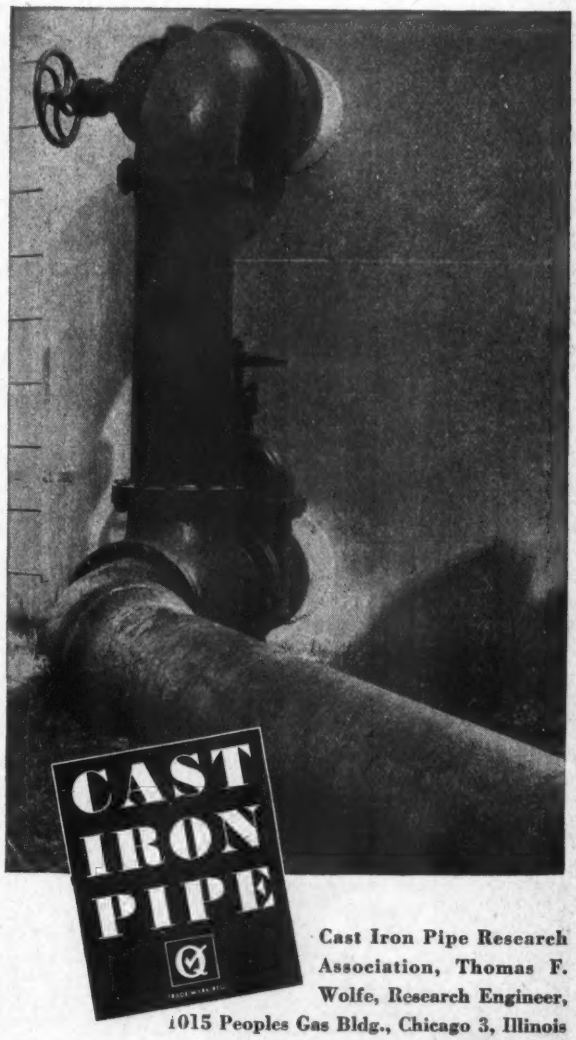

Cast Iron Pipe Research Association, Thomas F. Wolfe, Research Engineer, 1015 Peoples Gas Bldg., Chicago 3, Illinois

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For oil field, locomotive type and marine boilers. Water shows black — steam shows white; the water level is unmistakable. U-Bolt construction is strongest and simplest to service. Glass replaced by simply removing nuts on face of gage . . . unnecessary to work between gage and boiler. Conforms with A.S.M.E., Federal and State requirements when used for pressures specified by their respective codes.

This is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

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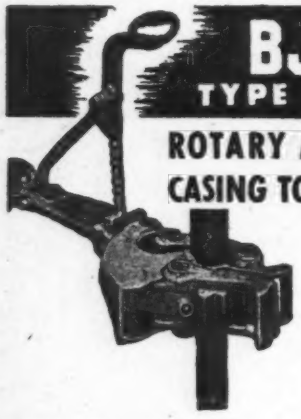
BJ
TYPE "C"
ROTARY AND
CASING TONGS



Designed for portable drilling rigs, workovers and for handling small sizes of drill pipe on the largest rigs, this tong has proven most popular and successful. All diameters from 2⅜" to 8⅜" are perfectly gripped by using proper size latch lug jaws. Tong can be equipped with either short or standard levers, dependent on derrick conditions. Hinge pin holes are flame hardened to insure long trouble-free life. This tong, like the BJ type "B," is designed to meet unusually tough service conditions.

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Among the Drilling Contractors

Mabee To Drill First Permian Well for Wilshire

Louis Mabee Drilling Co., Midland, will drill Wilshire Oil Co. of Los Angeles' first Permian basin venture, with Wilshire's rig which is being sent in from California. The planned 13,500-foot wildcat is 1 McElroy Ranch Co., Section 148, Block E, CCSD& RGNG Survey, west central Upton County, West Texas. Work is scheduled to get under way in near future.

Hall-Miller Makes Deal for 20 Wells

Hall-Miller Drilling Co., Oklahoma City, has made a tentative deal with L. C. Tharpe, St. Louis, and H. A. Huskey, Chicago, to drill 20 wells within the next year. First well to be drilled is 1 Miller, NW NW SW 22-21n-4w, 2 miles southwest of Covington, Garfield County, Oklahoma. Contract is for 4,800 ft. of Layton sand. Test is being supported by Anderson-Prichard, Magnolia, Vickers, Gulf, and Superior of California companies.

B. MacGregor, Fairfield, Ill., is contractor for Carl R. Shelton 1 Own fee, NW NW SE 21-3s-7e, Hamilton County, Illinois.

T. P. Pike Drilling Co., Los Angeles, will drill a Beloil Corp. wildcat on Kern County Land Co. property in Strand area, California.

General Petroleum, Ltd., Calgary, Alta, has finished drilling a Leduc field well for Atlantic Oils, Ltd., its Leduc 1, LSD 13, 23-50-26w4.

San Joaquin Drilling Co., Los Angeles, will drill Seaboard Oil Co. 51-20 Pauley - Seaboard, Lawndale field, California.

Cox Drilling Co. is contractor for Ellis, Morrison & Bement 3 Eldon Catt, 400 ft. from south and 600 ft. from west lines, SW SE SW 27-1n-9w, Pike County, Indiana.

Clark & Cowden Drilling Co., Dallas, has brought in a producer in Northwest Perry pool, Noble County, Oklahoma, its 2 Burgess, NW NE NW 8-21n-1w. This well made 300 bbl. per day through ¼-in. choke after 3,000 gal. acid in dolomite at 5,166-88 ft. Clark & Cowden 1 Burgess, SE NE NW 8-21n-1w, was also recently brought in as a producer.

Terry Drilling Co. has contract to redrill Duck Flat Oil Co. 33-3 Reserve, Grapevine-Tejon area, California.

G. H. Neighbors has contract for Sam E. Wilson, Jr., 1-B Hearne Estate, semiwildcat, F. C. Baker Survey A-112, Longwood field, Harrison County, East Texas.

Spartan Drilling Co. will drill Grady H. Vaughn 1 McCall Estate, wildcat in NW NE SE 30-17-18w, Columbia County, Arkansas. This test is scheduled for Smackover sand.

Acme Drilling Co. is drilling Basin Oil Co. 1 Collins-Wilson Community, wildcat in Richfield area, Orange County, California.

Imperial Oil, Ltd., now has five contractors drilling wells in Leduc field, Alberta. **Drilling Contractors, Ltd.,** Calgary, is running four rigs, and **General Petroleums, Ltd.,** Calgary, **Commonwealth Drilling Co.,** Calgary, **Young Drilling Co.** and **Can-Tex Drilling Co.,** Calgary, have one rig each.

Jack Grace, Wichita Falls, will drill Sinclair Prairie Oil Co. and Continental Oil Co. 1 Minor, a 6,400-ft. wildcat in Tract A, Milne Survey A-485, 2 miles northwest of Montague, Montague County, Texas.

Portable Drilling Co., Tulsa, is planning to drill 1 G. A. Cooper, NW SW SE 17-10n-2e, in newly discovered West Shawnee Lake field, Pottawatomie County, Oklahoma.

H. O. Grace, Wichita Falls, is drilling a 4,500-ft. test in Wichita County, North Texas, the Consolidated Oil 1 Boone, southeast of GC&SF Survey A-810.

T. W. W. Drilling Co. is drilling a Viola test near Rulo, Richardson County, Nebraska, the 1 Lewis, SW SE 30-10n-18e.

Rowan Drilling Co., Fort Worth, has contract to deepen a 6,700-ft. Howard County, West Texas, failure to 10,000

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MIDGET No. 1—1 swivel, 1/4" chain
DELTA No. 1—1 swivel, 5/16 or 3/8" chain
DIXIE No. 1—2 swivels, 7/16 or 1/2" chain
LONE STAR 1—2 swivels, 7/16, 1/2 or 5/8" chain
LONE STAR 2—2 swivels, 7/16, 1/2 or 5/8" chain

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DURBIN-DURCO
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ft. Former operator was Brown & Karcher, but test has been taken over by Seaboard Oil Corp. of Delaware. Well is 1 Fee-Caldwell, Section 32, Block 32, Township 3, north of T&P Survey, 17 miles north of Big Spring.

Sentex Drilling Co., Oklahoma City, has filed intention to drill 1-A Chapman, SE SW SE 10-14n-5e, a 3,500-ft. test, Seminole County, Oklahoma.

Ferrell Drilling Co., Great Bend, is drilling Alpine Oil & Royalty Co. 1 Edison, SW SW SE 30-23-12, wildcat 2 miles west of Bedford pool, Stafford County, Kansas.

Amick Drilling Co. is drilling a Mosser Dome, Montana, well, its 2 Kelly, SE SE NW 26-3s-24e.

Willis Copeland is drilling Ohio Oil Co. 1 Swenson Land & Cattle, wildcat in Section 26, Block 2, H&GN Survey, Garza County, Texas.

Gutowsky Brothers Drilling Co., Oklahoma City, have contract for Peppers Refining Co. 1 Hightower, NW NE NW 1-12-3w, outpost southwest of Witcher pool, Oklahoma County, Oklahoma.

Delta Drilling Co., Shreveport, is drilling Lone Star Producing 1 Pate, first of three tests in H. Secrets Survey, Oakwood field, Leon County, East Texas.

Beacon Drilling Co. has contract for Carter Oil Co. 1 Nichols-Buckholts, NW SW NE 23-2n-2w, Northeast Elmore pool, Garvin County, Oklahoma.

Brewster & Barnett, Houston, have contract for The Texas Co. 1 J. B. Barnhard, a proposed 10,000-ft. outpost to Blackfoot area of north Anderson County, East Texas, on 184-acre lease in southeast corner of Lot 3, I. P. Reinhardt Survey.

Midwest Drilling Co., Havre, Mont., is drilling 1 Schnitzmeier, SW SW SW 14-35n-16e, Cassady Structure, Montana.

Kingery Brothers Drilling Co., Saint Joe, Tex., has filed intention to drill 1 Pickett, NW NW NW 20-2s-10w, and 1 Kohout, SE SE SW 21-2s-11w, both in Cotton County, Oklahoma.

Meredith, Clegg & Hunt, Houston, are building derrick on Sohio Petroleum Co. 1 Sweet Lake Land & Oil Co.-Harrington Unit, Holmwood field, Calcasieu Parish, Louisiana. Contract depth is 10,400 ft.

Triangle Drilling Co., Oklahoma City, has been granted an Oklahoma charter with $10,000 capital stock. Incorporators are: M. T. Myers, Charles E. Stewart, and E. C. Keegan, all of Oklahoma City.

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STATISTICS and T

WEEKLY WELL COMPLETIONS . . . WEEK ENDED NOVEMBER 22, 1947

	Total of all wells					Cum.		Wildcat completions and discoveries									
								Cumulative total, 1947									
	Comp.	Oil	Gas	Dry	Footage	1947	1946	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	42	21	0	*21	49,224	1,539	1,422	0	0	0	0	0	3	0	0	2	5
Pennsylvania	78	36	4	†38	123,517	2,773	3,575	0	0	0	1	1	0	0	5	3	8
West Virginia	16	3	10	3	45,712	781	678	0	0	2	0	2	5	0	33	23	61
Ohio	34	4	9	‡21	84,624	1,213	1,141	0	0	1	1	2	0	0	7	40	47
Indiana	12	9	0	3	19,569	583	337	0	0	0	0	0	22	0	0	36	58
Kentucky	18	8	2	8	24,814	661	420	0	0	0	0	0	8	0	0	33	41
Illinois	39	20	0	19	114,486	1,868	2,085	1	0	0	6	7	60	0	1	317	378
Michigan	23	10	4	9	45,107	831	731	2	0	1	6	9	11	0	12	222	245
Kansas	44	18	11	15	142,723	2,423	1,794	3	0	0	3	6	39	0	13	311	363
Neb., Mo., Iowa	0	0	0	0	0	5	19	0	0	0	0	0	0	0	0	5	5
Oklahoma	75	40	2	33	256,721	3,623	2,694	2	0	1	16	19	104	8	20	611	743
Texas	194	123	5	66	835,389	8,260	7,045	11	0	0	33	44	269	53	75	1,282	1,679
North Central (Dist. 7-B & 9)	72	42	3	27	235,197	2,610	2,479	6	0	0	8	14	77	1	11	429	518
West (Dist. 7-C & 8)	48	41	0	7	239,051	2,014	1,575	3	0	0	4	7	42	0	3	152	197
Panhandle (Dist. 10)	11	8	1	2	35,300	422	284	0	0	0	0	0	1	0	2	10	13
Eastern (Dist. 5 & 6)	19	11	1	7	99,485	510	632	1	0	0	6	7	10	2	5	110	127
Gulf Coast (Dist. 3)	23	13	0	10	132,608	1,406	1,551	0	0	0	5	5	62	37	32	260	391
Southwest (Dist. 1, 2 & 4)	21	8	0	13	93,748	1,298	524	1	0	0	10	11	77	13	22	321	433
Louisiana	38	26	0	12	207,124	1,427	1,259	0	1	0	6	7	37	24	9	188	258
Northern	21	15	0	6	63,354	845	718	0	1	0	4	5	3	3	3	116	125
Southern	17	11	0	6	143,770	582	541	0	0	0	2	2	34	21	6	72	133
Arkansas	21	14	0	7	85,423	295	161	0	1	0	4	5	2	1	0	55	58
Mississippi	7	4	0	3	49,828	438	223	0	0	0	2	2	2	0	1	84	87
Southeastern States	1	0	0	1	9,017	56	39	0	0	0	1	1	0	0	0	48	48
Montana	10	7	2	1	18,590	270	292	0	0	1	0	1	6	0	8	23	37
Wyoming	9	6	0	3	39,691	232	154	1	0	0	3	4	13	0	6	41	60
Colorado-Utah	2	1	0	1	* 12,482	184	144	0	0	0	1	1	2	0	3	42	47
New Mexico	11	9	0	2	38,867	476	358	0	0	0	1	1	6	0	1	38	45
California	43	32	0	11	176,617	1,798	1,354	0	0	0	5	5	43	0	8	251	302
Total United States	717	391	49	277	2,379,525	29,736	25,925	20	2	6	89	117	532	86	202	3,655	4,575
Total previous week	705	373	81	251	2,245,120	29,019	25,348	10	3	3	84	100	512	84	196	3,566	4,458
Total November 23, 1946	577	283	67	227	1,681,360			7	0	0	93	90	506	39	112	3,126	3,783

Service wells included: *21, †37, ‡5.

CRUDE PRICES AND REFINERY ACTIVITY

GRAVITY SCHEDULES

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

Gravity—	Signal Hill, Calif.*	Oklahoma, Kansas	Gulf Coast Tex.†	West Tex.‡
18-18.9	$1.67	....	....	....
19-19.9	1.69	....	....	....
20-20.9	1.71	$1.75	....	$1.62
21-21.9	1.73	1.77	....	1.64
22-22.9	1.77	1.79	....	1.66
23-23.9	1.80	1.81	....	1.68
24-24.9	1.84	1.83	$2.06	1.70
25-25.9	1.88	1.85	2.08	1.72
26-26.9	1.91	1.87	2.10	1.74
27-27.9	1.95	1.89	2.12	1.76
28-28.9	1.99	1.91	2.14	1.78
29-29.9	2.02	1.93	2.16	1.80
30-30.9	2.06	1.95	2.18	1.82
31-31.9	2.09	1.97	2.20	1.84
32-32.9	2.12	1.99	2.22	1.86
33-33.9	....	2.01	2.24	1.88
34-34.9	....	2.03	2.26	1.90
35-35.9	....	2.05	2.28	1.92
36-36.9	....	2.07	2.30	1.94
37-37.9	....	2.09	2.32	1.96
38-38.9	....	2.11	2.34	1.98
39-39.9	....	2.13	2.36	2.00
40 and above	....	2.15	2.38	2.02

*Standard Oil Co. of California posting. †For crude from Daboval, El Campo, and Sandy Point. ‡Includes Lea County, New Mexico.

A.P.I. REFINERY REPORT, WEEK ENDED NOVEMBER 15

(Thousands of barrels)

District—	Crude runs, daily avg.	Production				Stocks at refineries, bulk terminals, in transit and in pipe lines			
		Gasoline†	Kerosine	Gas & dist. oil	Residual	Gasoline*	Kerosine	Gas & dist. oil	Residual
East Coast	768	2,035	237	1,037	1,486	18,103	8,331	18,768	9,164
Appalachian:									
District 1	88	274	51	76	79	2,087	459	796	435
District 2	58	175	27	44	90	885	141	253	228
Ind., Ill., Ky.	877	2,989	396	922	1,181	14,102	3,059	9,129	5,715
Okla., Kans., Mo.	438	1,506	131	564	451	6,771	1,215	3,911	1,723
Inland Texas	263	1,053	143	145	417	2,695	690	581	741
Texas Gulf Coast	1,284	3,940	709	1,722	1,681	14,903	3,780	10,538	8,418
La. Gulf Coast	373	990	285	443	454	5,243	2,193	3,490	3,010
N. La. and Ark.	74	185	55	84	116	1,473	430	428	233
Rocky Mountain:									
New Mexico	12	42	..	11	22	79	25	23	30
Other Rocky Mtn.	134	430	17	158	290	1,467	147	931	660
California	860	2,467	56	953	2,289	15,233	1,003	14,435	27,470
Nov. 15, 1947	5,229	16,086	2,107	6,159	8,556	83,041	21,473	63,283	57,827
Nov. 8, 1947	5,189	16,270	2,089	6,256	‡8,650	82,007	22,593	63,358	57,172
Nov. 16, 1946	4,706	14,688	1,684	5,622	7,692	88,108	21,854	69,424	60,186

*Finished and unfinished. †At refineries including natural blended. ‡Revised.

Bureau of Mines crude-oil stocks 222,901,000 bbl. as of November 15—down 802,000 bbl. One year ago 221,670,000 bbl.

FLAT CRUDE PRICES

Representative posted schedules per bbl.	
East Texas	$2.15
Kettleman Hills, California*	2.14
Beauregard Parish	2.10
Illinois Basin	2.27
Pecos County, Texas (Yates)	1.85
Bradford, Pennsylvania	4.50
Eastern Ill. and Western Ind.†	2.27
Tomball, Texas Gulf Coast	2.33

*37°-37.9°. †35° and above.

TRENDS

DAILY AVERAGE PRODUCTION FOR WEEK

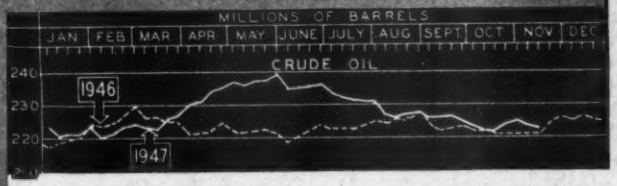
	Nov. 22 crude oil	B. of M. Nov. demand	Nov. 15 crude oil
Alabama	1,250	1,200	1,200
Arkansas	84,550	82,000	85,000
California	926,400	930,000	926,500
Colorado	48,120	45,000	48,530
Eastern	61,750	64,200	65,000
Florida	950	1,000	750
Illinois	177,500	200,000	175,900
Indiana	17,400	18,000	18,100
Kansas	296,100	306,000	298,650
Kentucky	27,300	26,000	26,300
Louisiana	459,250	450,000	459,000
North Louisiana	118,000	.....	117,750
South Louisiana	341,250	.....	341,250
Michigan	47,995	47,000	43,520
Mississippi	111,265	100,000	106,765
Montana	24,580	24,000	24,370
Nebraska	550	600	500
New Mexico	117,175	115,000	117,175
Oklahoma	410,700	405,000	411,300
Texas	2,370,925	2,320,000	2,370,925
Dist. 1 (Southwest)	24,425	.....	24,425
Dist. 2 (Southwest)	162,150	.....	162,150
Dist. 4 (Southwest)	259,475	.....	259,475
Dist. 3 (Gulf Coast)	491,575	.....	491,575
Dist. 5 (Eastern)	41,125	.....	41,125
Dist. 6 (Eastern)	118,175	.....	118,175
East Texas field	318,575	.....	318,575
Dist. 7-C (West)	40,750	.....	40,750
Dist. 8 (West)	645,825	.....	645,825
Dist. 7-B (W. Central)	43,600	.....	43,600
Dist. 9 (N. Central)	136,075	.....	136,075
Dist. 10 (Panhandle)	89,175	.....	89,175
Wyoming	130,690	125,000	123,510
Total United States	*5,314,450	5,260,000	5,303,045
Change from prev. wk., up	11,405		

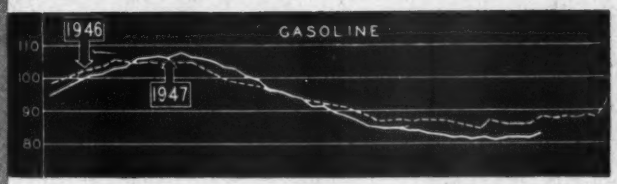
Total production January 1-November 22 †1,649,207,855 bbl.

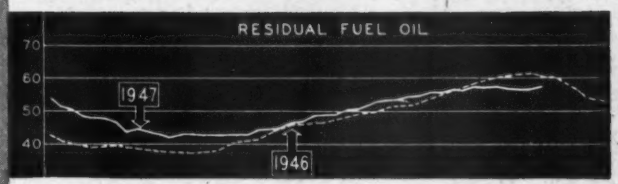
Same period last year (crude plus cond.) 1,549,290,760 bbl.

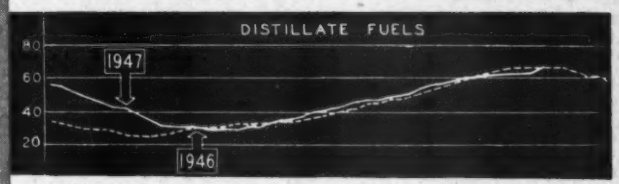
*Not incl. 41,675 bbl. condensate. †Incl. 10,952,825 bbl. condensate.

OIL STOCKS IN THE UNITED STATES

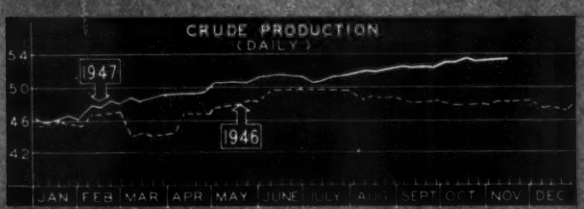


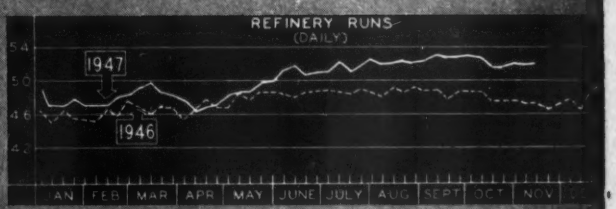




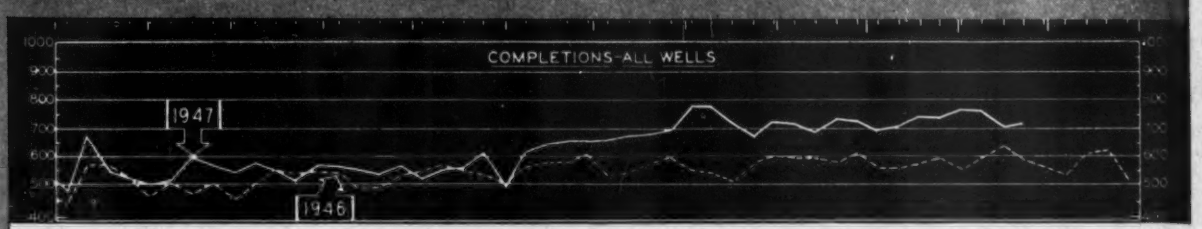


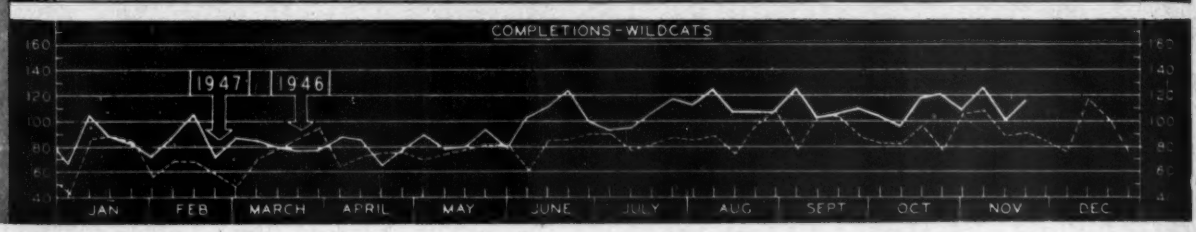
DAILY OPERATIONS

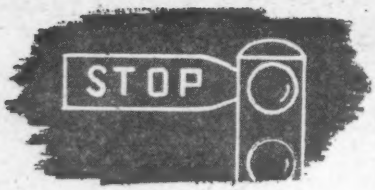




Solid line charts weekly completions, service wells in Eastern area included.







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NEK-EEZ—the only truly restful pillow for sleeping in a sitting position—provides amazing *neck ease* and back rest by comfortably supporting the head in a restful position. Complete with washable, removable dark brown cover . . . $4 and up. Postage prepaid. Send check or money order or write for free folder.

Thompson's NEK-EEZ Company

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MARKETS

WITH a substantial and general drop in temperature over the nation last week came an increasingly urgent demand for heating oils, particularly from the Eastern Seaboard.

The mounting consumer demands were beginning to drain dealers' stocks in that area faster than they could be replenished. Primary suppliers were holding distributors to strict allocations in an effort to stretch available stocks through the short-supply period. Some sources indicated that the Eastern Seaboard, which is estimated to use 2,000,000 bbl. daily, may be heading into its first actual heating-oil shortage since the end of the war.

The reduced stocks in the area are estimated to be 10,000,000 lower than they were a year ago, according to a National Petroleum Council committee, which said the only tankers not now in service are those owned by the Government awaiting sale, reconditioning, or repair.

Change to Coal Urged

The mayor's fuel committee in New York City warned consumers that that city's fuel-oil supplies would be 10 to 15 per cent under demand this winter and that installations where possible should be converted back to coal use. Many observers were in agreement that the worst is yet to come, with the peak loads of January and February ahead, and that the demand for light heating oils on the East Coast will reach 20 per cent higher than last year.

Retail outlets of Standard Oil Co. of Pennsylvania, it was disclosed last week, now are getting about 85 per cent of the amount of premium they received during July, August, and September, and about 70 per cent of regular gasoline. As a result of the general allocation program in the Philadelphia and surrounding areas, many sales are being limited to 5 gal. a customer.

Prices on the Gulf Coast were steady with the supply situation still tight. Lack of tankers was slowing down the movement of products to the Atlantic Seaboard, and as a result storage facilities in the Gulf area were becoming taxed to capacity. Most products in storage were sold but could not be moved. Barge movement of products was reported normal, while some easing up in the tank-car situation was seen.

Natural Gasoline Up

In the Mid-Continent area natural gasoline was increased ¼ cent as of November 20, bringing Group 3 grade 26-70 natural gasoline to 7⅛ cents per gallon. The Texas price hike followed, becoming effective November 21 and brought the Texas postings to 6⅝ cents per gallon. Other tank-car prices for the Mid-Continent area products remained strong and unchanged.

No noticeable loosening in the tight gasoline situation was reported, and housebrand gasolines continued to move at about 1 cent above posted prices. Premium reportedly was bringing 2 cents over the market and even higher. Bonuses and premiums continued to be paid on some spot transactions.

Several operators expressed increasing concern over premiums being paid for crude oil. One refiner said he offered 3 cents a barrel bonus, only to lose out to a refiner from another state who offered 11 cents.

Representative Quotations

Representative spot-market quotations of leading suppliers as of November 24, 1947. Figures are f.o.b. plant for tank-car shipment in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor	Texas Gulf Coast
Regular gasoline, 73-75 octane	9-10¼	10.5-10.9* 9.6-10†	9-11¼
Premium gasoline, 78-80 octane	10¼-11	10.2-12	9½-12
42-44 w.w. kerosine	8-9	8.1-8.9	7½-9½
No. 2 straw fuel oil	7½-8½	7.2-8	7-8½
No. 6 residual	$2-2.35	$2.22-2.52	$1.98-2.75

*Branded (74-76 octane); †Unbranded (74-76 octane).

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	7⅛	6⅝	6⅞
Grade 18-55	8.55	7.95	8.25

LUBRICATING OILS

South Texas

200 vis., No. 2-3 neutral	11-12¼
750 vis., No. 3-4 neutral	13-14½
2,000 No. 5-6 neutral	14½-16

LUBRICATING OILS

Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	29-31
200 vis. No. 3 neutral, 0-10 pp.	18-19

Western Pennsylvania

145-155 vis. 10 p.t. bright stock	47
180 vis. p.t. neutral	45

CRUDE-SCALE WAX

Mid-Continent

130-132 A.S.T.M. melting point	7½-8¼

EQUIPMENT MEN ... in the News

Web Wilson Appoints Defee and McKernan

Web Wilson Oil Tools, Inc., announces the appointment of J. M. "Jimmie" Defee and C. J. "Chili" Mc-

J. M. DEFEE

C. J. McKERNAN

Kernan as agents in West Texas and New Mexico. Headquarters will be at Odessa, where ample stocks will be warehoused.

Defee has had approximately 12 years of oil-field experience in the West Texas area including actual field experience as roughneck and driller. He was connected with Green Head Bit & Supply Co. for approximately 3 years and for the past year was associated with Patterson-Ballagh in West Texas. McKernan was with Wilson Supply Co. in the Gulf Coast area and for the past year has been with Patterson-Ballagh in West Texas. He spent 3½ years in the Army Air Corps and was discharged as a captain.

Personnel Changes in Continental Supply

Continental Supply Co., announces the opening of a new store at El Campo, Tex. This store is under the management of D. F. Bell, formerly manager of the Raymondville, Tex., branch. This point is under the supervision of W. G. Fitzpatrick, district manager, Houston.

G. W. Patterson has assumed management of the Raymondville store, being transferred from the store at Falfurrias, Tex., where he served in the same capacity. George M. Edge, formerly floorman at Falfurrias, has been named manager there.

Young Tours Northwest

Fred M. Young, president and general manager of Young Radiator Co., Racine, Wis., left recently for an extended speaking tour of the West and Northwest. His address, "Developments in Engine Cooling Systems," will be given to members of the Society of Automotive Engineers in Salt Lake City, Spokane, Seattle, Vancouver, B. C., Portland, San Francisco, and Los Angeles.

Homco Opens New Store and Office

Houston Oil Field Material Co. recently has opened a fishing-and-cutting-tool service point in Oklahoma City, at 2800 Southeast 29th Street. The opening of this service extension was celebrated with an open house featuring a barbecue, which was attended by drilling personnel in the area. Raymond G. Alford is the store manager. Russell Yost, Bob Acuff, and Grover Pool are operators stationed in the area. Joe Zachary and W. W. Liddell are store men.

Homco also is opening additional sales offices in the Fort Worth-Dallas area. W. B. Will, formerly with Homco before World War II, and most recently with Homco's Dallas subsidiary, Briggs-Weaver Machinery Corp., has been assigned to assist C. L. (Hal) Roach, who is district sales representative in For Worth. Will's office will be 707 Construction Building in Dallas.

Koppers Appoints Division Executive

B. J. C. van der Hoeven has been appointed assistant general manager of the chemical division of Koppers Co., Inc. The position is a newly created one in Koppers' expanding chemical division. During the war van der Hoeven was manager of operations of the Kobuta, Pa., styrene and butadiene plant which was built and operated by Koppers for the Government. Since early last year, he has been chief of the company's chemical engineering department, engineering and construction division.

Bethlehem Promotes Hawkinson

H. L. Hawkinson, Jr., recently has been promoted to local representative for machinery sales in the Houston sales office of Bethlehem Supply Co. Hawkinson, formerly field representative at Odessa, Tex., has been employed by the company 6½ years He is a graduate of Oklahoma University and served 4 years in the Armed Forces during the war.

Sperry Products to Relocate In Connecticut

Sperry Products, Inc., manufacturers of supersonic and electrical nondestructive testing and measuring instruments, will move its manufacturing plant and general offices from Hoboken, N. J., to Danbury, Conn., during the summer of 1948. A 20-acre site has been acquired and construction of a monitor-type manufacturing building and a three-story office building will begin immediately. Present branch offices in Chicago and St. Loius will be maintained.

Mannion Named Vice President

Trinity Equipment Corp., of Orange and Newark, N. J., announces the recent appointment of James V. Mannion as vice president in charge of manufacturing. Mannion has enjoyed a widely diversified career in process-control work and instrumentation having joined Brown Instrument Co. in the late twenties. After several years with Brown in the Mid-Continent area, he located with Phillips Petroleum Co. at its Kansas City refinery. He came to New York to join the engineering staff at Alco Products and shortly before the war left there to take over the instrument department of Foster Wheeler Corp. oil division.

Gibson and Hill Elected Directors

Charles D. W. Gibson and John A. Hill, vice presidents of Air Reduction Co., Inc., have been elected directors of the company.

Gibson, vice president in charge of sales, joined the company as a salesman in 1919. After successively managing the Richmond and Detroit sales districts, in 1926 he was appointed assistant vice president and general sales manager. Since 1937 he has been vice president in charge of sales.

Hill, formerly secretary of the Air Reduction, was made vice president in 1945. He attended Amherst College, graduating in 1925. He subse-

quently attended Columbia law school, graduating in 1928.

Fairbanks-Morse Personnel Changes

Fairbanks, Morse & Co., Chicago, announce the following changes in its sales organization:

J. C. Elmburg, manager of the company's Boston branch house, has been transferred to the company's Atlanta branch house to assume the position of manager of that area. He replaces F. N. Van Epps, who recently resigned. V. O. Harkness, who has been manager of the diesel division at Chicago headquarters, has been appointed manager of the Boston branch, and T. M. Robie of Chicago has been appointed to the position of manager of the general diesel sales division.

Greene Heads Merrimac's Advertising

Edmund Greene, formerly of Cambridge, Mass., has been appointed sales promotion and advertising manager of Merrimac Division of Monsanto Chemical Co. Greene joined Monsanto's industrial and public relations department at the company's St. Louis headquarters in June of this year. He is a member of the Society of the Plastics Industry and of the Society of Plastics Engineers.

Merrimac Division has its headquarters in Everett, Mass, with sales offices in Boston.

Durametallic Celebrates 30 Years

Durametallic Corp., manufacturers of flexible metallic packing, celebrates 30 years of service to the petroleum and allied industries. Founded in 1917 by Charles C. Hall, the company's history has been marked by the development and improvement of many types of flexible metallic packing. With the production experience of the company's president, S. A. Schaeffer, and the engineering ability of the founder's son, Richard D. Hall, the company has maintained a policy of developing packings to meet specific needs of industry.

Hyster Names Nikand

Arthur Nikand has been appointed factory manager of the Portland plant of the Hyster Co., manufacturers of lift and straddle trucks and tractor-mounted construction equipment. Nikand was first employed as a machinist at Hyster in 1934 after working in a similar position for Willamette Iron & Steel Co., Portland, for 10 years. He was appointed foreman of hoist equipment assembly in 1938, and assistant factory manager the next year, a position he filled until assuming his new position.

Jebens Joins Patterson Foundry

Raymond H. Jebens has joined the Patterson Foundry & Machine Co., East Liverpool, Ohio, as chief chemical engineer. He will be available for consultation on processing problems and will apply his experience to the development and application of Patterson equipment. Jebens was formerly associated with the DuPont Co. where his work included synthesis expermentation and process engineering in organics, heavy chemicals, and paints. He has also been associated with Kimberly-Clark Corp. since 1945 as chemical engineer.

Wagner Electric Names Furtney

Wagner Electric Corp. announces that its Tulsa suboffice has been transferred from the Houston branch to the Kansas City branch office territory. H. M. Furtney, who recently joined the Wagner organization, will be in charge of the Tulsa suboffice. A. W. Maas, formerly at Tulsa, has been transferred to the Philadelphia branch office.

Westinghouse Electric International Names Three

The board of directors of Westinghouse Electric International Co. has elected Herman J. Mauderer as vice president and auditor. Simultaneously, Arthur L. Partridge was appointed assistant to the president and J. D. Mickle manager of the import department.

Wood Joins Dallas Bank

Cliff Wood of Memphis, Tenn., has been elected a vice president of Republic National Bank of Dallas and will assume his new duties January 1. Wood is resigning as vice president and head of the correspondent bank department of First National Bank of Memphis to join the correspondent bank and general operations of Republic National Bank.

New Distributor for Scot Ring Gaskets

Southern California Oil Tool Co., Los Angeles, manufacturer of Scot ring gaskets, announces the appointment of Corbett Corp., 2431 Summer Street, Houston, as Mid-Continent distributor. Corbett Corp., of which J. B. Gibson is president, is well known throughout the Texas and Gulf Coast areas as distributors of many leading oil-industry products.

Blackwood and Malone To New York Office

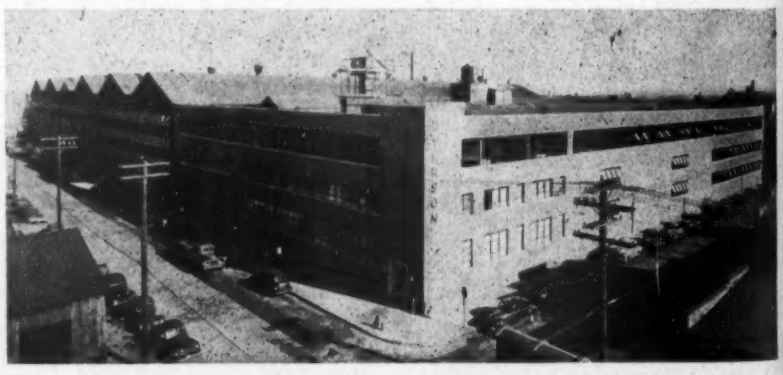
Wm. Powell Co., valve manufacturers of Cincinnati, announce that S. H. Blackwood, formerly with Mid West Piping & Supply Co., Inc., is now with the New York office of Wm. Powell Co. at 50 Church Street. T. J. Malone, formerly with Crane Co., is also now in the New York office of Wm. Powell Co.

Solvay Names Draper and Seener

Solvay Sales Corp. announces the appointment of Neal M. Draper as branch manager and E. J. Seener as assistant branch manager of the St. Louis branch, located at 3615 Olive Street. Draper replaces M. S. Johnson who is being transferred to the Boston branch with offices at 45 Milk Street.

Hall and Gray Form New Company

K. G. Hall and Arthur Gray, formerly with Barrett Division, Allied Chemical & Die Corp., have organized Pipe Line Protection Service, Inc., 26-16 Skellman Avenue, Long Island City, New York, which contracts the coating and wrapping of pipe.



This recently completed addition to the Cleveland steel-service plant of Joseph T. Ryerson & Son, Inc., makes the plant the largest of its kind in the Cleveland area. William O. Springer is plant manager